

AD/A-001 400

USE OF COMPUTERS IN HUMAN FACTORS ENGINEERING

DEFENSE DOCUMENTATION CENTER

NOVEMBER 1974

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| Performance(Human) | Simulation | Retrieval |
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| This bibliography contains 178 references to reports pertinent to the application of techniques for computer handling of human factors data. | | |
| The indexes included are Corporate Author-Monitoring Agency and Subject. | | |

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FOREWORD

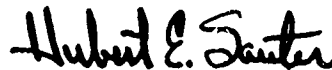
This bibliography contains 178 references to reports processed in the Defense Documentation Center's data bank from January 1953 through August 1974.

Pertinent references to the application of techniques for computer handling of human factors data are included in this bibliography.

The indexes are: Corporate Author-Monitoring Agency and Subject.

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OFFICIAL



HUBERT E. SAUTER
Administrator
Defense Documentation Center

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-247 346

BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

MAN-COMPUTER SYMBIOSIS

(U)

JAN 60 8P LICKLIDER, J.C.R.;
CONTRACT: AF49 638 355
MONITOR: AFOSR TN-60-1191

UNCLASSIFIED REPORT

DESCRIPTORS: *COMPUTERS, *HUMAN FACTORS ENGINEERING,
*HUMANS, DATA PROCESSING, LANGUAGE, MEMORY (PSYCHOLOGY) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-255 518

APPLIED PSYCHOLOGICAL SERVICES VILLANOVA PA

TECHNIQUES FOR EVALUATING OPERATOR LOADING IN MAN-MACHINE SYSTEMS. A MODEL FOR DIGITAL SIMULATION OF ONE AND TWO-OPERATOR MAN-MACHINE SYSTEMS (U)

MAR 61 IV SIEGEL, ARTHUR I. WOLF, J. JAY; CRAIN, KENNETH:
CONTRACT: NONR249200

UNCLASSIFIED REPORT

DESCRIPTORS: *APPLIED PSYCHOLOGY, *HUMAN FACTORS ENGINEERING, COMPUTERS, DESIGN, DIGITAL COMPUTERS, FEEDBACK, FLIGHT SIMULATORS, LOADING, OPERATORS (PERSONNEL), REFUELING, SIMULATION, STRESS (PSYCHOLOGY) (U)

THE EXTENSION OF A MODEL, WHICH HAD AS ITS AIM THE PREDICTION OF THE EFFECTIVENESS OF UNI-OPERATOR MAN-MACHINE SYSTEMS, TO SIMULATE TWO-OPERATOR SYSTEMS IS DESCRIBED. THE TWO-OPERATOR MODEL MAY ALSO BE EMPLOYED FOR EVALUATING UNI-OPERATOR SYSTEMS. A HIGH SPEED DIGITAL COMPUTER IS USED TO CALCULATE AND RECORD SIMULATED OPERATOR PERFORMANCE DATA FOR EVERY ACTION OF EACH OPERATOR AND TO YIELD AN INDICATION OF SYSTEM EFFECTIVENESS ON THE BASIS OF THESE SIMULATIONS. AFTER DEVELOPMENT, THE MODEL WAS APPLIED TO THE SIMULATION OF IN-FLIGHT REFUELING OF AN F8U RECEIVER AIRCRAFT BY AN A4D TANKER AIRCRAFT. THE MANEUVERS AND ACTIONS OF THE F8U PILOT DURING APPROACH AND PROBE INSERTION AS WELL AS THE CONCOMITANT ACTIONS OF THE TANKER AIRCRAFT PILOT DURING THIS FLIGHT TASK WERE SIMULATED. THE RESULTS FROM THE MODEL AS REFLECTED THROUGH THE DIGITAL SIMULATION WERE COMPARED WITH EMPIRICAL CRITERION DATA ON ACTUAL IN-FLIGHT REFUELING SUCCESS AND WERE FURTHER EVALUATED ON THE BASIS OF THEIR COMPATIBILITY WITH LOGICAL EXPECTATION. THE RESULTS FROM THIS INITIAL APPLICATION OF THE MODEL, APPEAR TO CONFORM WITH REALITY AND ARE GENERALLY REASONABLE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-259 296

HUMAN SCIENCES RESEARCH INC MCLEAN VA

A COMPARISON OF TWO DIVERSE METHODOLOGICAL APPROACHES
TO RESEARCH ON COMPLEX SYSTEMS (U)

NOV 59

1V

VAUGHAN, W.S. JR; MCGRATH, J.E.

REPT. NO. RM 59 22 SM

CONTRACT: NONR252500

UNCLASSIFIED REPORT

DESCRIPTORS. *OPERATIONS RESEARCH, *RESEARCH MANAGEMENT,
DATA PROCESSING; HUMAN FACTORS ENGINEERING, MATHEMATICAL
ANALYSIS, SCIENTIFIC RESEARCH (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-259 453

GENERAL ELECTRIC CO SANTA BARBARA CALIF TECHNICAL MILITARY
PLANNING OPERATION

THREAT EVALUATION AND ACTION SELECTION FOR THE 1965-
1975 STRATEGIC ENVIRONMENT. TASK I. HUMAN FACTORS
STUDY (U)

DEC 59 IV DOSSETT, WILLIAM I
REPT. NO. RM 59 THP 54
CONTRACT: AF19 604 5881
MONITOR: AFCRL TR59 196 3

UNCLASSIFIED REPORT

DESCRIPTORS: *BEHAVIOR, *COMMUNICATION THEORY,
*COMPUTERS, *HUMAN FACTORS ENGINEERING, *NATIONAL
DEFENSE, *REACTION (PSYCHOLOGY), *STRATEGIC AIR COMMAND,
*STRESS (PSYCHOLOGY), *WAR POTENTIAL, CONTROL SYSTEMS,
EMOTIONS, GROUP DYNAMICS, LEADERSHIP, MODEL TESTS,
SELECTION, SOCIAL COMMUNICATION, SOCIOMETRICS, SPEECH
TRANSMISSION, THEORY (U)

THE PURPOSE OF THIS REPORT IS TO MAKE A PRELIMINARY
ANALYSIS OF MAN AS A POSSIBLE COMPONENT IN A THREAT
EVALUATION AND ACTION SELECTION SYSTEM (TEAS).
THE MAJOR OBJECTIVE OF TEAS IS TO FUNCTION AS A
SPECIALIZED STRATEGIC DETERRENT SYSTEM OPERATING TO
MITIGATE THE THREAT POSED BY PREMEDITATED ATTACK.
IN GENERAL, THE SYSTEM WILL BE CAPABLE OF DETECTING
THE EXISTENCE OF, AND EVALUATING THE NATURE AND
MAGNITUDE OF ANY THREAT POSED BY A POTENTIALLY
HOSTILE NATION. FURTHERMORE, THE CAPABILITIES OF
THE SYSTEM WILL ENABLE THE SELECTION OF AN
APPROPRIATE SET OF COUNTERACTIONS BASED ON A
PREVIOUSLY FORMULATED GRADUATED COMMITMENT OF
RESPONSE DOCTRINE. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-260 063

STANFORD RESEARCH INST MENLO PARK CALIF

THE STRUCTURING AND ANALYSIS OF COMPLEX SYSTEM
PROBLEMS

(U)

MAY 61 IV SCHAEFFER, K. H.; SHAPERO, ALBERT;
CONTRACT: AF49 638 1020
MONITOR: AFOSR 810

UNCLASSIFIED REPORT

DESCRIPTORS: *OPERATIONS RESEARCH; ANALYSIS;
COMMUNICATION THEORY; COMPUTERS; DESIGN; HUMAN FACTORS
ENGINEERING; MATHEMATICAL COMPUTER DATA; SYMPOSIA (U)

MANY COMPLEX SYSTEMS CONSIST OF TOO MANY DIFFERENT
TYPES OF ELEMENTS AND ARE INFLUENCED BY TOO MANY
FACTORS TO LEND THEMSELVES READILY TO
CONCEPTUALIZATION THROUGH MATHEMATICAL MODELS,
WITHOUT INTRODUCING UNREALISTIC OVERSIMPLIFICATIONS.
TO STRUCTURE SUCH SYSTEMS REALISTICALLY, AN
APPROACH HAS BEEN DEVELOPED WHICH BEGINS WITH THE
CLASSIFICATION OF THE ELEMENTS AFFECTING THE SYSTEM
AND THE DETERMINATION OF THE EXISTENCE OF CERTAIN
TYPES OF RELATIONS BETWEEN THESE ELEMENTS. THE
APPROACH WHICH IS KNOWN AS THE SYSTEM ANALYSIS
AND INTEGRATION MODEL (SAIM) HAS BEEN APPLIED
TO THE ANALYSIS OF A NUMBER OF SYSTEM PROBLEMS
CONCERNING WEAPON SYSTEM DEVELOPMENT, INCLUDING
COMMAND AND CONTROL. OTHER PROBLEM AREAS TO WHICH
THE METHOD HAS BEEN APPLIED ARE THE ANALYSIS OF
POSTATTACK RECOVERY, POLITICAL CONFLICTS, AND LARGE-
SCALE ORGANIZATIONS. THE PAPER CONCLUDES WITH A
DISCUSSION OF THE FUNCTION OF THIS GENERAL APPROACH
IN THE DEVELOPMENT OF FORMAL MODELS WHICH
REALISTICALLY REPRESENT COMPLEX SYSTEM PROBLEMS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-260 311

MICHIGAN UNIV ANN ARBOR INST OF SCIENCE AND
TECHNOLOGY

PROBLEMS IN MEETING FUTURE COMBAT SURVEILLANCE
DISPLAY REQUIREMENTS

(U)

JUN 61 1V DEVOE, R.P.; HOAGBEN, J.E.;
REPT. NO. 2900 275 S
CONTRACT: DA36 039SC78801

UNCLASSIFIED REPORT

DESCRIPTORS: *COMBAT INFORMATION CENTERS, *DATA
PROCESSING, *DISPLAY SYSTEMS, *MILITARY INTELLIGENCE,
CODING, CORRELATION TECHNIQUES, EFFECTIVENESS, HUMAN
FACTORS ENGINEERING, MAPS, OPTICAL IMAGES, RADAR
INTERFERENCE, SYMPOSIA, VISION, VISUAL ACUITY (U)

RESEARCH WAS CONCERNED WITH THE COMPLEX VISUAL
DISPLAYS FOR SYSTEMS IN WHICH HUMAN OPERATORS ARE
REQUIRED TO RAPIDLY ASSOCIATE MANY DIFFERENT TYPES OF
INFORMATION AND CORRECTLY CORRELATE THEM. DISPLAY
PROBLEMS ASSOCIATED WITH THE INTERMEDIATE PROCESSING
OF COMBAT SURVEILLANCE INFORMATION ARE DISCUSSED, AND
AREAS OF RESEARCH THAT WOULD MAKE POSSIBLE THE DESIGN
OF BETTER DISPLAYS ARE SUGGESTED. TWO OF THE MOST
VEXING PROBLEMS THAT ARE BEING INVESTIGATED ARE THOSE
OF CLUTTER AND KEYSER. THE SOLUTION TO THESE
PROBLEMS WILL REQUIRE MORE RESEARCH.

(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-260 505

OPERATIONAL APPLICATIONS OFFICE AIR FORCE ELECTRONIC
SYSTEMS DIV BEDFORD MASS

PLANS FOR MAN-COMPUTER COMMUNICATIONS RESEARCH USING
THE RELIABILITY TEST ASSEMBLY COMPUTER AND THE
ADVANCED DISPLAY CONSOLE AS RESEARCH TOOLS (U)

JUN 61 IV

UNCLASSIFIED REPORT

DESCRIPTORS: •DATA PROCESSING, •DISPLAY SYSTEMS, •HUMAN
FACTORS ENGINEERING, COMMUNICATION THEORY, COMPUTERS,
RELIABILITY, TEST EQUIPMENT, TESTS (U)
IDENTIFIERS: MITRE, SAGE (U)

THE ADVANCED DISPLAY CONSOLE AND RTA COMPUTER
DEVELOPED UNDER SAGE II CONTRACTS WILL BE MODIFIED
FOR USE IN MAN-MACHINE COMMUNICATIONS EXPERIMENTS.
MAN-MACHINE COMMUNICATION PROCEDURE WILL BE STUDIED
IN FIVE ASPECTS: (1) PREPARATION OF DATA TO MAKE
UP VISUAL MESSAGES, (2) PRESENTATION OF THE
MESSAGES, (3) RETRIEVAL OF DATA NOT ALREADY
DISPLAYED, (4) CHOICE BEHAVIOR OF THE MAN, AND
(5) PROCESSING OF THE MAN'S OUTPUT. PRESENT
SCHEDULING INDICATES FULL AVAILABILITY OF THE
EQUIPMENT FOR COMMUNICATIONS EXPERIMENTS BY 1
FEBRUARY 1962. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-261 626

TECHNICAL OPERATIONS INC BURLINGTON MASS

DISPLAY SYSTEMS FOR DIGITAL SIMULATIONS

(U)

SEP 60 1V KUGEL, PETER;
REPT. NO. B 60 40
CONTRACT: AF33 600 35190

UNCLASSIFIED REPORT

DESCRIPTORS: *DIGITAL COMPUTERS, COMPUTERS, DIGITAL
SYSTEMS, HUMAN FACTORS ENGINEERING, PROGRAMMING
(COMPUTERS), SIMULATION

(U)

THIS REPORT DEALS WITH SYSTEMS TO HELP HUMAN BEINGS
INTERPRET THE OUTPUTS OF DIGITAL COMPUTERS BY HAVING
MACHINES PERFORM MANY OF THE MORE MECHANICAL TASKS
INVOLVED IN INTERPRETATION. THE AIMS OF SUCH
SYSTEMS AND THE CAPABILITIES WHICH THEY SHOULD HAVE
TO ACCOMPLISH THESE AIMS ARE CONSIDERED. THE
REPORT ALSO SUGGESTS GENERAL SPECIFICATIONS FOR A
PARTICULAR SYSTEM, PROVIDES A FRAMEWORK WITHIN WHICH
THIS SYSTEM CAN BE DEALT WITH FURTHER, AND CONTAINS
SOME SUGGESTIONS FOR IMPLEMENTING CONSTRUCTION.
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-261 956

APPLIED PSYCHOLOGICAL SERVICES VILLANOVA PA

TECHNIQUES FOR EVALUATING OPERATOR LOADING IN MAN-MACHINE SYSTEMS. A FURTHER APPLICATION OF A MODEL FOR DIGITAL SIMULATION OF ONE OR TWO-OPERATOR MAN-MACHINE SYSTEMS (U)

JUN 41 1V 5 TOLLAUTHOR I. WOLF, J. JAY
CONTRACT: NONR249200

UNCLASSIFIED REPORT

DESCRIPTORS: *APPLIED PSYCHOLOGY, HUMAN FACTORS ENGINEERING, AIRCRAFT INTERCEPT CONTROL SYSTEMS, COMPUTER, DESIGN, DIGITAL COMPUTERS, EFFECTIVENESS, FEEDBACK, FLIGHT SIMULATION, OPERATORS (PERSONNEL), REFUELING, SIMULATION, STRESS (PSYCHOLOGY), TEST METH(U)

THE PURPOSE OF THE TECHNIQUE IS TO ALLOW PREDICTION OF SYSTEM EFFECTIVENESS WHILE A SYSTEM IS IN THE EARLY DESIGN STAGE AND/OR COMPARATIVE EVALUATION OF ALTERNATIVE SYSTEM DESIGNS. THE MODEL IS BASED ON THE USE OF A DIGITAL COMPUTER WHICH SEQUENTIALLY SIMULATES OPERATOR PERFORMANCE OF EACH SUBTASK IN A TOTAL TASK. AS A RESULT OF VARIOUS CALCULATIONS, OUTPUT RECORDS ARE OBTAINED OF SUBTASK SUCCESS OR FAILURE, TASK SUCCESS OR FAILURE, PEAK STRESS, TERMINAL STRESS, IDLE TIME, WAITING TIME, TEAM COHESIVENESS, AND, IN THE EVENT OF SUCCESSFUL TASK COMPLETION, TIME AVAILABLE BUT UNSPENT. THE METHOD AND RESULTS OF APPLYING THE TECHNIQUE TO AN AIR INTERCEPT BY A TEAM COMPOSED OF A PILOT AND A RADAR-OBSERVER ARE REPORTED. NO STATISTICALLY SIGNIFICANT DIFFERENCES WERE OBTAINED BETWEEN THE PREDICTIONS FROM THE MODEL AND REAL LIFE, OUTSIDE CRITERIA DATA FOR THE SAME TASK. GENERALLY, THE RESULTS FROM THE MODEL WERE RATIONAL AND CONFORMED WITH EXPECTANCY. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-262 119

HUMAN FACTORS RESEARCH INC LOS ANGELES CALIF

HUMAN INFORMATION TRANSMISSION AS A FUNCTION OF
SELECTED VISUAL AND AUDITORY STIMULUS DIMENSIONS (U)

JUL 61 IV BUCKNER, DONALD N. HARABEDIAN, ALBERT;
CONTRACT: NONR245300

UNCLASSIFIED REPORT

DESCRIPTORS: *COMMUNICATION SYSTEMS, *COMMUNICATION
THEORY, *HUMAN FACTORS ENGINEERING, DATA PROCESSING,
DATA TRANSMISSION SYSTEMS, HEARING, REACTION
(PSYCHOLOGY), SENSES(PHYSIOLOGY),
STIMULATION(PHYSIOLOGY), TESTS, THRESHOLDS
(PHYSIOLOGY) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-262 166

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

A SURVEY OF CHECKOUT EQUIPMENT USED IN AIR FORCE
WEAPON SYSTEMS, WITH EMPHASIS ON THE MAN-MACHINE
RELATIONSHIP

(U)

MAY 61 IV POPE, LOUIS T.:
MONITOR: ASD TN61 38

UNCLASSIFIED REPORT

DESCRIPTORS: *HUMAN FACTORS ENGINEERING, AIRCRAFT
EQUIPMENT, AUTOMATIC, AUTOMATION, DESIGN, GUIDED
MISSILES, TEST EQUIPMENT, TESTS, WEAPONS

(U)

ENGINEERING FILES OF 13 AIR FORCE WEAPON
SYSTEMS WERE SEARCHED FOR INFORMATION ON THE VARIOUS
TYPES OF CHECKOUT EQUIPMENT IN USE BY THE AIR
FORCE TODAY. IN THIS SEARCH, EMPHASIS WAS PLACED
ON THE MAN-MACHINE RELATIONSHIPS INVOLVED IN THE
OPERATION OF THE EQUIPMENT. THE INFORMATION WAS
USED IN DEVELOPING A TENTATIVE LEVEL-OF-
AUTOMATION SCALE; AND 37 ITEMS OF CHECKOUT
EQUIPMENT WERE RATED ON THIS SCALE. CHECKOUT
EQUIPMENT PROBLEM AREAS WHICH SHOULD BE INVESTIGATED
ARE IDENTIFIED. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-262 481

AMELCO INC LOS ANGELES CALIF

DATA PROCESSING. THE EXTENSION OF MAN'S SENSORS AND
PHYSICAL CAPABILITIES. ANIP RESEARCH (U)

JUN 61 IV

UNCLASSIFIED REPORT

DESCRIPTORS: *DATA PROCESSING, *HUMAN FACTORS
ENGINEERING, COMPUTERS, DIGITAL SYSTEMS, ELECTRONICS,
EQUATIONS, INSTRUMENTATION (U)

CONTENTS: DATA PROCESSING WHAT IS DATA
PROCESSING DERIVATION OF ENERGY-INFORMATION
RELATION THE OVER-ALL SYSTEM THE DATA
PROCESSING SYSTEM REMARKS CONCERNING FUNCTION
GENERATORS SYSTEM BLOCK DIAGRAM A METHODOLOGY
FOR EVALUATING DATA PROCESSING SYSTEMS
INFORMATION FLOW VS CLOCK RATE INFORMATION
CHANNEL CAPACITY ANALYSIS OF SOME EXISTING
SYSTEMS OTHER PARAMETERS MICROELECTRONICS
SUMMARY OF MICROELECTRONICS TO DATE PHASE I--
APPLICATION TO PRODUCTION: THE FUNCTIONAL
ARRAY (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-262 498

DOUGLAS AIRCRAFT CO INC EL SEGUNDO CALIF

HUMAN FACTORS FOR ARMY-NAVY INSTRUMENTATION
PROGRAM

(U)

AUG 61 IV
REPT. NO. ES 40394
CONTRACT: NONR107600

UNCLASSIFIED REPORT

DESCRIPTORS: *FLIGHT SIMULATORS, *HUMAN FACTORS
ENGINEERING, ANALYSIS, CONTROL SYSTEMS, DATA PROCESSING,
DISPLAY SYSTEMS, FLIGHT, FLIGHT TESTING,
INSTRUMENTATION, RECORDING PAPER, TELEVISION EQUIPMENT,
TEST EQUIPMENT (U)

THIS DOCUMENT REVIEWS THE TERMS OF REFERENCE, THE
PREMISES AND THE PROGRESS OF THE HUMAN FACTORS
ASPECTS OF THE ARMY-NAVY INSTRUMENT PROGRAM
AS CONTROLLED BY THE DOUGLAS AIRCRAFT COMPANY
AND REPORTS ACHIEVEMENTS GAINED ELSEWHERE BOTH WITHIN
AND OUTSIDE THE PROGRAM. PROPOSED AREAS AND
PRIORITIES FOR ADDITIONAL RESEARCH AND APPLICATION
ARE ALSO INCLUDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-263 643

HRB-SINGER INC STATE COLLEGE PA

DISPLAY PROBLEMS IN AEROSPACE SURVEILLANCE SYSTEMS.
PART I. A SURVEY OF DISPLAY HARDWARE AND ANALYSIS OF
RELEVANT PSYCHOLOGICAL VARIABLES (U)

JUN 61 257P CRUMLEY, LLOYD; DIVANY, RICHARD;
REPT. NO. HRB-256-R-2-PT-1
CONTRACT: AF19 604 7368
MONITOR: ESD TR61 33

UNCLASSIFIED REPORT

DESCRIPTORS: *ANTIAIRCRAFT DEFENSE SYSTEMS, *CATHODE RAY
TUBES, *DISPLAY SYSTEMS, *HUMAN FACTORS ENGINEERING,
*PHOTOGRAPHIC RECORDING SYSTEMS, AERIAL TARGETS,
BRIGHTNESS, COLORS, DATA PROCESSING, DATA STORAGE
SYSTEMS, DATA TRANSMISSION SYSTEMS, DETECTION, PLASTICS,
PSYCHOLOGY, RECORDING SYSTEMS, SENSES(PHYSIOLOGY),
THERMOPLASTIC RESINS, VISUAL ACUITY (U)

RESEARCH CONCERNS DETERMINATION OF THE INFORMATION
PRESENTATION REQUIREMENTS OF HUMAN DATA PROCESSING
ROLES IN FUTURE AIR AND AEROSPACE SURVEILLANCE
SYSTEMS. DISPLAY PARAMETERS AND OPERATOR
CHARACTERISTICS WHICH ARE RELEVANT TO DISPLAY
SELECTION ARE DESCRIBED, AND REVIEWS OF SOME OF THE
PERTINENT LITERATURE ARE PRESENTED. THE DESCRIPTION
AND SPECIFICATION OF OPERATOR ROLES IS ALSO INCLUDED.
THESE ROLES ARE BASED UPON A CONCEPTUAL MODEL OF
FUTURE AIR AND AEROSPACE SURVEILLANCE SYSTEM AND A
REVIEW OF THE STATE OF THE ART IN DISPLAYS.
(AUTHOR) (U)

UNCLASSIFIED

CDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-266 320

PSYCHOLOGICAL RESEARCH ASSOCIATES INC ARLINGTON VA

A DATA ORGANIZATION MODEL FOR THE PERSONNEL
SUBSYSTEM

(U)

SEP 61 1V MARKS, MELVIN R.
CONTRACT: AF33 616 5738
MONITOR: ASD TR61 447

UNCLASSIFIED REPORT

DESCRIPTORS: •AVIATION PERSONNEL, •HUMAN FACTORS
ENGINEERING; AIRCRAFT, CODING, DATA, DATA PROCESSING,
DATA STORAGE SYSTEMS, GROUND SUPPORT EQUIPMENT, GUIDED
MISSILES, MAINTENANCE PERSONNEL, REPORTS (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-269 110

LOCKHEED AIRCRAFT CORP BURBANK CALIF

RESEARCH DIRECTED TOWARD DESIGN AND DEVELOPMENT OF
EXPERIMENTAL DATA PROCESSING EQUIPMENT (U)

NOV 61 1V
CONTRACT: AF19 604 6104
MONITOR: AFCRL 977

UNCLASSIFIED REPORT

DESCRIPTORS: *DATA PROCESSING, *LABORATORIES, AIR
TRAFFIC CONTROL SYSTEMS, AIRCRAFT INTERCEPTION, APPLIED
PSYCHOLOGY, COMMAND AND CONTROL SYSTEMS, CONTROL
SYSTEMS, DESIGN, GUIDED MISSILES, HUMAN FACTORS
ENGINEERING, RELIABILITY, SIMULATION (U)
IDENTIFIERS: AN/TSQ-13 (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-271 440
HRB-SINGER INC STATE COLLEGE PA

DISPLAY PROBLEMS IN AEROSPACE SURVEILLANCE
SYSTEMS

(U)

DESCRIPTIVE NOTE: FINAL REPT.

OCT 61 122P

GRANT, GEORGE; HOSTETTER, ROBERT;

REPT. NO. HRB-256-F

CONTRACT: AF19 604 7368

MONITOR: ESD TDR61 57

UNCLASSIFIED REPORT

DESCRIPTORS: *AERIAL RECONNAISSANCE, *DISPLAY SYSTEMS,
AIR CONTROL CENTERS, CODING, COLORS, COMBAT INFORMATION
CENTERS, COMMUNICATION THEORY, CONFIGURATION, DATA
PROCESSING, DESIGN, HUMAN FACTORS ENGINEERING, RADAR
EQUIPMENT, TARGET RECOGNITION, TARGETS (U)

THE OVER-ALL OBJECTIVE WAS TO DETERMINE THE
INFORMATION PRESENTATION REQUIREMENTS FOR HUMAN DATA
PROCESSING ROLES IN FUTURE AIR AND AEROSPACE
SURVEILLANCE SYSTEMS. THE CONCLUSIONS AND
RECOMMENDATIONS LISTED ARE BASED UPON INFORMATION
GATHERED IN A COMPREHENSIVE LITERATURE SEARCH AND
PERTINENT DATA REFLECTING THE PRESENT STATE OF THE
ART IN DISPLAYS AND RELATED HUMAN DATA PROCESSING
ROLES. FROM THE DATA AVAILABLE, THIS REPORT
PROVIDES: (1) AN APPROACH TO THE PROBLEM OF
SPECIFYING AND COMPARING HUMAN INFORMATION
PRESENTATION REQUIREMENTS; (2) A DISCUSSION OF
DISPLAY PROBLEMS AND REQUIREMENTS BASED ON CURRENTLY
AVAILABLE RESEARCH DATA; (3) A STRUCTURE FOR THE
COLLECTION AND USE OF SYSTEM INFORMATION REQUIREMENTS
IN DETERMINING DISPLAY NEEDS; (4) A TECHNIQUE
(PROFILE METHOD) FOR USE IN SCREENING AND
EVALUATING DISPLAYS IN TERMS OF INFORMATIONAL
REQUIREMENTS; AND (5) A PROGRAM FOR FUTURE
RESEARCH IN AREAS THAT WILL OPTIMIZE MAN AS A
COMPONENT IN THE SYSTEM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-271 948

BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

MEASUREMENT OF TIME-VARYING AND NONLINEAR DYNAMIC
CHARACTERISTICS OF HUMAN PILOTS (U)

DEC 61 IV ELKIND, JEROME I.; GREEN, DAVID M.
CONTRACT: AF33 616 7397
MONITOR: ASD TR/1 225

UNCLASSIFIED REPORT

DESCRIPTORS: *AVIATION PERSONNEL, *HUMAN FACTORS
ENGINEERING, *NONLINEAR SYSTEMS, *PILOTS, COMPUTERS,
CONTROL SYSTEMS, CORRELATION TECHNIQUES, EFFECTIVENESS,
FLIGHT, MEASUREMENT, SIMULATION, THEORY, TIME (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-272 913

GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

SUBIC: SHIP CONTROL XIV ADVANCED FBM SUBMARINE SHIP
CONTROL CONSOLE (U)

AUG 61 IV BLAIR, W.C.; HENRY, W.O.;
REPT. NO. U411 61 102
CONTRACT: NONR251200

UNCLASSIFIED REPORT

DESCRIPTORS: *COMBAT INFORMATION CENTERS, *CONTROL
SYSTEMS, *DISPLAY SYSTEMS, *SUBMARINES, CONTROL, CONTROL
PANELS, COSTS, DATA PROCESSING, DIGITAL SYSTEMS, GUIDED
MISSILES, HUMAN FACTORS ENGINEERING, REDUCTION,
SHIPBOARD, SUBMARINE PERSONNEL, UNDERWATER TO SURFACE (U)
IDENTIFIERS: SQUIRE, SUBIC (U)

AN INTEGRATED SHIP CONTROL CONSOLE IS DESCRIBED
WHICH IS DESIGNED SO ONE MAN, UNDER NORMAL
WATCHSTANDING CONDITIONS, CAN PERFORM EFFECTIVELY ALL
NORMAL SHIP CONTROL OPERATIONS: STEERING AND DIVING,
HOVERING SUBMERGING AND SURFACING, TRIM AND BALLAST
CONTROL, MISSILE COMPENSATION, AND SPEED ORDERING
CONTROL; AND SO, IN EMERGENCY SITUATIONS, AN
ADDITIONAL MAN CAN PERFORM AT AN EMERGENCY HELMSMAN'S
STATION. THREE MEN NOW PERFORM SHIP CONTROL
OPERATIONS IN NORMAL CONDITIONS, AND A FOURTH MAN IS
REQUIRED DURING AN EMERGENCY SITUATION. THIS
INTEGRATED SHIP CONTROL CONSOLE IS DESIGNED FOR FBM
SUBMARINES AND IS ALSO GENERALLY COMPATIBLE WITH THE
PRESENT REQUIREMENTS FOR ASW AND ATTACK SUBMARINES.
(AUTHOR) (U)

UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-274 035

RAND CORP SANTA MONICA CALIF

HUMAN FACTORS IN AUTOMATIC CHECKOUT EQUIPMENT: AN
ANNOTATED BIBLIOGRAPHY

(U)

MAR 62 IV

UNCLASSIFIED REPORT

DESCRIPTORS: •AUTOMATION, •BIBLIOGRAPHIES, •HUMAN
FACTORS ENGINEERING, •MAINTENANCE, ATTENTION, CHECKOUT
EQUIPMENT, COMPUTERS, COSTS, ELECTRONIC EQUIPMENT,
FLIGHT INSTRUMENTS, MAINTENANCE PERSONNEL, QUALITY
CONTROL, TIME, TRAINING

(U)

A SIMPLE FIVE-CATEGORY SYSTEM WAS USED IN
ORGANIZING THE DOCUMENTS. THE FIVE SUBJECT AREAS
ARE: (1) GENERAL PHILOSOPHY AND REVIEW OF
AUTOMATIC CHECKOUT METHODS, (2) MAINTAINABILITY
DIRECTIVES AND GUIDES, (3) MODELS OF THE
MAINTENANCE PROCESS, (4) HUMAN PERFORMANCE OF
CHECKOUT AND FAULT-ISOLATION TASKS, AND (5)
SPECIFIC CHECKOUT SYSTEMS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-276 372

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

A LABORATORY MODEL FOR SYSTEMS RESEARCH: A TERMINAL
AIR TRAFFIC CONTROL SYSTEM (U)

SEP 61 IV ALEXANDER L.T., COOPERBAND, A.S.;
REPT. NO. TM639

UNCLASSIFIED REPORT

DESCRIPTORS: •AIR TRAFFIC CONTROL SYSTEMS, AIR CONTROL
CENTERS, COMPUTERS, DESIGN, HUMAN FACTORS ENGINEERING,
OPERATIONS RESEARCH, SIMULATION, TEST METHODS (U)

THE TERMINAL AIR TRAFFIC CONTROL SYSTEM
(TATCS) WAS DESIGNED AS A LABORATORY VEHICLE FOR
STUDYING FUTURE REQUIREMENTS OF AIR CONTROL CENTERS
AND THE RELATIONSHIP OF MEN AND MACHINES AND THEIR
INTERACTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-282 419

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES ENGINEER
WATERWAYS EXPERIMENT STATION.

HUMAN FACTORS RESEARCH IN ELECTRONICS MAINTENANCE: AN
ANALYSIS OF RECENT TRENDS, WITH SOME SUGGESTIONS FOR
THE FUTURE (U)

JUL 62 IV RIGNEY, JOSEPH W.; HOFFMAN, LYLE S.;
REPT. NO. TR35
CONTRACT: NONR22822

UNCLASSIFIED REPORT

DESCRIPTORS: •ELECTRONICS, •HUMAN FACTORS ENGINEERING,
•MAINTENANCE PERSONNEL, AUTOMATION, HANDBOOKS,
MAINTENANCE (U)

THE PRESENT STATUS OF HUMAN FACTORS RESEARCH AND
DEVELOPMENT IN THE ELECTRONICS MAINTENANCE FIELD AND
SOME NEEDED RESEARCH APPROACHES FOR THE FUTURE ARE
ASSESSED. SELECTED LITERATURE PERTAINING TO
MAINTENANCE WAS REVIEWED TO UNCOVER IMPORTANT TRENDS.
SIX BROAD AREAS ARE IDENTIFIED, AND REPRESENTATIVE
STUDIES IN EACH, ALONG WITH THEIR IMPLICATIONS, ARE
DISCUSSED. (1) THE MEASUREMENT OF
MAINTAINABILITY OF EQUIPMENT IN THE FIELD HAS BEEN
ATTEMPTED FROM A TIME-ORIENTED AND A FEATURE-ORIENTED
BAS. PROCEDURES FOR PREDICTING THE
MAINTAINABILITY OF FUTURE EQUIPMENT RELY ON
SIMULATING FAILURE RATES AND REPAIR ACTIONS. (2)
NUMEROUS MILITARY STANDARDS AND SPECIFICATIONS, AND
HUMAN FACTORS HANDBOOKS TO GUIDE THE DESIGN OF
EQUIPMENT FOR MAINTAINABILITY HAVE BEEN PRODUCED.
(3) THE AUTOMATION OF MAINTENANCE TASKS, BY MEANS
OF AUTOMATED TEST EQUIPMENT, HAS BEEN A MAJOR EFFORT
IN THE DEVELOPMENT OF MOST LARGE EQUIPMENT SYSTEMS.
(4) THERE HAVE BEEN RELATIVELY FEW STUDIES OF
MAINTENANCE VARIABLES WHICH HAVE USED THE CLASSICAL
EXPERIMENTAL METHOD. (5) MANY INVESTIGATIONS IN
TRADITIONAL PERSONNEL AREAS HAVE BEEN CONDUCTED IN
THE MAINTENANCE FIELD. (6) MATHEMATICAL MODELING
TECHNIQUES ARE BEING USED TO SIMULATE HUMAN PROBLEM
SOLVING AND OTHER COMPLEX BEHAVIORAL PROCESSES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-283 330

SMITH ELECTRONICS INC CLEVELAND OHIO

DESIGN AND USE OF MAN-MACHINE SYSTEMS

(U)

NOV 59

1V

MILLER, ROBERT B.; CHAPMAN, ROBERT L.;

CONTRACT: NONR-135408

UNCLASSIFIED REPORT

DESCRIPTORS: *MILITARY RESEARCH, *AUTOMATION, *HUMAN
FACTORS ENGINEERING, *MILITARY RESEARCH, MILITARY
BUDGETS, COMMUNICATION THEORY, COMPUTERS, DECISION
MAKING, DEPARTMENT OF DEFENSE, DISPLAY SYSTEMS,
DOCUMENTS, INFORMATION RETRIEVAL, LANGUAGE, MANAGEMENT
ENGINEERING, PERSONNEL, RESEARCH MANAGEMENT, SIMULATION,
WEAPONS (U)

IDENTIFIERS: SYSTEMS (M)

PROBLEMS IN BASIC RESEARCH THAT NEED TO BE SOLVED
IN ORDER TO MAKE THE MOST EFFECTIVE USE OF MEN IN
WEAPON SYSTEMS ARE DISCUSSED. DISCUSSION IS
LIMITED TO TOPICS IN WHICH PRESENT RESEARCH SUPPORT
APPEARS TO BE INADEQUATE TO MEET THE NEEDS OF THE
DEPARTMENT OF DEFENSE IN THE TIME PERIOD 1965-
70, AND TO THOSE TOPICS IN WHICH THE DEPARTMENT OF
DEFENSE HAS A PECULIAR INTEREST BECAUSE OF ITS
GENERALITY. BASIC SCIENTIFIC THEORY ON SYSTEMS
CONSIDERED AS WHOLE IS INADEQUATE. SYSTEM
SIMULATION TECHNIQUES ARE INADEQUATE. CURRENT
TECHNIQUES FOR PERSONNEL OPERATIONS ARE INADEQUATE TO
INSURE THAT NEW MAN-MACHINE SYSTEMS WILL BE
EFFECTIVELY OPERATED, MAINTAINED AND SUPPORTED. A
GENERALIZED MAN-TO-MACHINE CONTROL LANGUAGE IS NEEDED.
KNOWLEDGE OF DISPLAYS IS INADEQUATE BOTH IN TERMS
OF WHAT INFORMATION TO DISPLAY AND HOW BEST TO
DISPLAY IT. METHODS OF INDEXING RESEARCH DATA AND
INFORMATION FOR EFFICIENT USE OF MECHANIZED STORAGE
AND RETRIEVAL SYSTEMS ARE INADEQUATE. A FOCUS IS
NEEDED FOR THE PRESENT WIDELY SCATTERED MANMACHINE
SYSTEM RESEARCH ACTIVITIES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-283 487

ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS

A COMPARISON OF TWO LOGIC SYMBOL CODING TECHNIQUES IN
A SIMULATED DIGITAL DEVICE MAINTENANCE
ENVIRONMENT (U)

JUL 62 IV BAKER, JAMES D.; WHITEHURST, ALBERT J.;
REPT. NO. TDR62 196
MONITOR: ESD TDR62 196

UNCLASSIFIED REPORT

DESCRIPTORS: *DATA PROCESSING, *DIGITAL COMPUTERS,
*LANGUAGE, ANALYSIS OF VARIANCE, CIRCUITS, CODING,
COMPUTER LOGIC, CONFIGURATION, DIGITAL SYSTEMS, HUMAN
FACTORS ENGINEERING, MAINTENANCE, MATHEMATICAL LOGIC,
TRAINING DEVICES, WIRING DIAGRAMS (U)

THIS STUDY WAS DESIGNED TO EVALUATE WHICH OF TWO
TECHNIQUES IS BETTER FOR ENCODING THE LOGIC SYMBOLS
IN DETAILED LOGIC DIAGRAMS TO CONVEY INFORMATION
ABOUT DIGITAL CIRCUITS. ONE TECHNIQUE EMPLOYED
SHAPE ENCODING TO DIFFERENTIATE BASIC LOGIC
FUNCTIONS; THE OTHER USED ALPHABETIC IDENTIFIERS.
THE FINDINGS SHOWED THAT USING SHAPE ENCODED
SYMBOLS IN SIMULATED DETAILED LOGIC DIAGRAMS
RESULTED IN A SIGNIFICANT REDUCTION IN THE TIME
REQUIRED TO SOLVE MAINTENANCE TYPE PROBLEMS. IT
IS CONCLUDED THAT SHAPE ENCODING IS THE BETTER OF THE
TWO TECHNIQUES, FOR USE IN OPERATIONAL SITUATIONS,
IF TIME-SAVING IS OF CONCERN. BASED UPON
OBSERVATIONS MADE DURING THE DESIGN AND CONDUCT OF
THIS STUDY, TWO SETS OF RECOMMENDATIONS ARE MADE.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-283 971

MI RE CORP BEDFORD MASS

DISPLAY COLOR CODING FOR A VISUAL SEARCH TASK (U)

JUN 62 IV SMITH, SIDNEY L.
REF. NO. TSR7TDR62 214
CONTRACT: AF33 600 39852
MONITOR: ESD TDR62 214

UNCLASSIFIED REPORT

DESCRIPTORS: *CODING, *COLOR VISION, *DATA PROCESSING,
*DISPLAY SYSTEMS, ANALYSIS, DATA, EXPERIMENTAL DATA,
HUMAN FACTORS ENGINEERING, MACHINES, HUMANS, NUMBERS,
TAB. S (DATA) (U)

ABSTRACT IS PRESENTED WHICH DESCRIBES THE RESULTS OF AN EXPERIMENTAL STUDY OF THE EFFECTS OF DISPLAY COLOR CODING ON VISUAL SEARCH TIME. TWELVE SUBJECTS EACH VIEWED A SERIES OF 300 DISPLAYS, WHICH VARIED IN DISPLAY DENSITY, IN NUMBER OF COLORS USED, IN THE PARTICULAR COLOR OF THE TARGET, WITH EITHER A WHITE OR BLACK BACKGROUND, UNDER CONDITIONS WHERE THE SUBJECT EITHER KNEW THE COLOR OF THE TARGET IN ADVANCE, OR DID NOT. NEITHER THE PARTICULAR COLOR OF THE TARGET NOR THE DISPLAY BACKGROUND HAD ANY SIGNIFICANT EFFECT ON SEARCH TIME. SEARCH TIME INCREASED REGULARLY WITH INCREASING DISPLAY DENSITY. FOR MULTICOLORED DISPLAYS, WHEN THE COLOR OF THE TARGET WAS KNOWN IN ADVANCE, SEARCH TIMES WERE CONSIDERABLY SHORTER THAN WHEN THE TARGET COLOR WAS UNKNOWN. WHEN THE COLOR OF THE TARGET WAS UNKNOWN, SEARCH TIMES WERE NOT SIGNIFICANTLY DIFFERENT THAN THOSE FOR SINGLE-COLORED DISPLAYS.
AUTH (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-285 218

ELECTRONICS AND ORDNANCE DIV AVCO CORP CINCINNATI
OHIO

THE DATA FLOW ANALYSIS OF A MOBILE ATC AID (U)

AUG 62 1V BUSCH, ALLEN C.; MCNAIR, ROBERT J.;
KIRBY, FREDERICK J.;
REPT. NO. TDR62 190AE 207 62 7
CONTRACT: AF19 628 244
MONITOR: ESD TDR62 190

UNCLASSIFIED REPORT

DESCRIPTORS: *AIR TRAFFIC CONTROL SYSTEMS, *AIR TRAFFIC
CONTROLLERS, ANALYSIS, COMMUNICATION SYSTEMS, COMPUTERS,
DISPLAY SYSTEMS, EFFECTIVENESS, ELECTRONIC EQUIPMENT,
FLIGHT PATHS, HUMAN FACTORS ENGINEERING, MATHEMATICAL
ANALYSIS, OPERATIONS RESEARCH, SCHEDULING (U)
IDENTIFIERS: AN/TSW-5 (U)

AN ANALYSIS OF INTERNAL DATA FLOW OF AIR
TRAFFIC CONTROL CENTRAL AN/TSW-5 (MODIFIED
TO INCLUDE A FLIGHT PATH PREDICTION COMPUTER AND A
TIME SCHEDULE DISPLAY UNIT) INDICATES THAT THE
MODIFIED SEMIAUTOMATIC SHELTER OPERATIONS ARE
IMPROVED IN THE FOLLOWING WAYS: IMPROVED CONTROLLER
ABILITY TO EFFICIENTLY INTERLEAVE ARRIVING AND
DEPARTING AIRCRAFT; IMPROVED CONTROLLER COGNIZANCE
OF THE ENTIRE TRAFFIC SITUATION; IMPROVED OPERATIONAL
EFFECTIVENESS UNDER JAMMING; AN ACCEPTANCE RATE IN
EXCESS OF 50 AIRCRAFT PER HR BY THE AN/TSQ-47;
ADDITIONAL TOOLS AND MEANS TO COMPENSATE FOR FAILURE
OF RADAR OR OTHER NAVIGATIONAL AIDS ARE PROVIDED;
CONTROLLERS BECOME PROFICIENT AT AN EARLIER TIME IN
THE TRAINING EXPERIENCE CYCLE; AND THE DECISION
MAKING TASK LOAD ON THE ENTIRE AN/TSW-5 CONTROL
TEAM IS REDUCED. WITH COMPUTER PATH-PREDICTION AND
SCHEDULING PROVIDED, THE COMMUNICATION CHANNEL LOAD
FACTOR IS LESS THAN 70% AT ALL CONTROLLER POSITIONS
WHEN HANDLING 50 APPROACHES PER HR. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-288 837

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

PROGRAMMED DECISIONS IN PROGRAMMED INSTRUCTION (U)

AUG 62 IV COULSON, JOHN E.;

REPT. NO. SP 933 001 00

UNCLASSIFIED REPORT

DESCRIPTORS: •AUTOMATION, •EDUCATION, •TEACHING
MACHINES, DATA PROCESSING, DIGITAL COMPUTERS, HUMAN
FACTORS ENGINEERING, LEARNING, PROGRAMMING (COMPUTERS),
STUDENTS (U)

FLEXIBLE SEQUENCES KNOWN AS BRANCHING PROGRAMS ARE USED TO
ADAPT TEACHING MATERIALS TO INDIVIDUAL STUDENTS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-292 144

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

EFFECT OF VARIATION OF THE DRIFT PARAMETER ON CONTROL
OF A STOCHASTIC PROCESS (U)

AUG 62 1V PEARSON, WILLIAM H.;
REPT. NO. TDR62 72
PROJ: AF-7183
MONITOR: AMRL TDR-62-72

UNCLASSIFIED REPORT

DESCRIPTORS: *CONTROL SIMULATORS, *DIFFERENCE EQUATIONS,
*HUMAN FACTORS ENGINEERING, COMPUTERS, PROBABILITY (U)

THIS RESEARCH EXAMINES MAN'S ABILITY TO CONTROL A SIMPLE PROCESS WHOSE SYSTEMATIC DRIFT IS OBSCURED BY RANDOM VARIATIONS. OF THE MANY COMBINATIONS OF SYSTEMATIC DRIFT AND RANDOM VARIATION POSSIBLE IN SUCH A PROCESS, FOUR WERE INVESTIGATED EXPERIMENTALLY. UNDER TWO OF THESE CONDITIONS THE PROCESS WOULD, IF UNCORRECTED, TEND TO DIVERGE FROM THE CONTROL LIMITS. UNDER THE OTHER TWO CONDITIONS THE PROCESS WOULD TEND TO REMAIN WITHIN OR RETURN TO THE CONTROL LIMITS. FOR THE TWO EXPLOSIVE CONDITIONS AN APPROPRIATE CONTROL STRATEGY WOULD BE TO CORRECT THE PROCESS BEFORE IT EXCEEDED THE CONTROL LIMITS. FOR THE TWO SELF-CONTROLLED CONDITIONS AN APPROPRIATE STRATEGY WOULD BE TO CORRECT INFREQUENTLY. SUBJECTS CORRECTED BEFORE CONTROL LIMITS WERE EXCEEDED MORE FREQUENTLY UNDER THE EXPLOSIVE CONDITIONS THAN UNDER THE SELF-CONTROLLED CONDITIONS. HOWEVER, UNDER THE SELF-CONTROLLED CONDITIONS THE SUBJECTS CORRECTED MORE FREQUENTLY THAN NECESSARY. THIS SUGGESTS THAT WHEN OPERATING A SELF-CONTROLLED PROCESS HUMANS DO NOT BEHAVE OPTIMALLY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-293 995

MASSACHUSETTS INST OF TECH LEXINGTON LINCOLN LAB

A DATA PROCESSING FORMALISM

(U)

NOV 62

IV

ARMENTI, A.W.; SCHAFFER, B.J.; WINETT,

J.M.;

REPT. NO. TR283TDR62 257

CONTRACT: AF19 604 7400

MONITOR: ESD TDR62 257

UNCLASSIFIED REPORT

DESCRIPTORS: *DATA PROCESSING, *PROGRAMMING (COMPUTERS),
COMPUTER LOGIC, CONTROL SYSTEMS, DESIGN, HUMAN FACTORS
ENGINEERING, LANGUAGE, MACHINE TRANSLATION,
SEQUENCES (MATHEMATICS)

(U)

DEVELOPS A LANGUAGE SYSTEM FOR TRANSMITTING
COMPUTER-PROCESSING IDEAS FROM ONE SYSTEMS DESIGNER TO
ANOTHER.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-294 779

AIR FORCE BALLISTIC MISSILE DIV INGLEWOOD CALIF

HUMAN ENGINEERING DESIGN STANDARDS FOR MISSILE SYSTEM
EQUIPMENT (U)

NOV 58 1V
REPT. NO. E 57 8 A

UNCLASSIFIED REPORT

DESCRIPTORS: *GUIDED MISSILES, *HUMAN FACTORS
ENGINEERING, ANTHROPOMETRY, AUTOMATION, CATHODE RAY
TUBES, CODING, COLORS, CONDUCTIVITY, CONTROL, CONTROL
KNOBS, CONTROL PANELS, CONTROL SYSTEMS, DESIGN, DISPLAY
SYSTEMS, GROUND SUPPORT EQUIPMENT, GUIDED MISSILE
PERSONNEL, HAZARDS, HUMIDITY, ILLUMINATION, MARKERS,
NOISE, PHYSICAL PROPERTIES, RELIABILITY, SAFETY DEVICES,
SELECTION, STANDARDIZATION, SWITCHES, TABLES(DATA),
TEMPERATURE, VIBRATION (U)
IDENTIFIERS: ELECTRIC CONDUCTORS, UNITIZATION,
SWITCHES, FAIL SAFE DESIGN (M)

THIS EXHIBIT WAS PREPARED FOR DESIGN ENGINEERS.
IT SETS FORTH DESIGN PRINCIPLES AND PRACTICES, BOTH
GENERAL AND SPECIFIC, TO BE USED IN DESIGNING
EQUIPMENT FOR MAXIMUM UTILIZATION BY GUIDED MISSILE
OPERATOR AND MAINTENANCE PERSONNEL. IN ADDITION,
THIS EXHIBIT IS AN ATTEMPT TO PROVIDE A BASIS FOR
DESIGN STANDARDIZATION WITHIN AND AMONG SYSTEMS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-295 166

BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

STUDIES IN THE ORGANIZATION OF MAN-MACHINE
SYSTEMS

(U)

DEC 62 1V
REPT. NO. 970
CONTRACT: AF49 638 355

UNCLASSIFIED REPORT

DESCRIPTORS: *COMPUTERS, *HUMAN FACTORS ENGINEERING,
DESIGN, HUMANS, RESEARCH MANAGEMENT, SCIENTIFIC RESEA(U)

STUDIES IN THE ORGANIZATION OF MAN-MACHINE SYSTEMS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY - SEARCH CONTROL NO. /ZHK13

AD-297 443

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

PROBLEMS ENCOUNTERED IN DEVELOPING AND MAINTAINING A
FIELD SYSTEM TRAINING PROGRAM (U)

SEP 59 IV ALEXANDER, L. T. ; FORD, J. D. ;
REPT. NO. SP 107

UNCLASSIFIED REPORT

DESCRIPTORS: • TRAINING, AIR CONTROL CENTERS, AIR DEFENSE
COMMAND, AIR TRAFFIC CONTROLLERS, DATA PROCESSING, HUMAN
FACTORS ENGINEERING, INFORMATION RETRIEVAL, MILITARY
REQUIREMENTS, MOTIVATION, PERSONNEL, RADAR OPERATORS,
SELECTION, SIMULATION, SYMPOSIA (U)

PROBLEMS ENCOUNTERED IN DEVELOPING AND MAINTAINING A FIELD
SYSTEM TRAINING PROGRAM.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-400 617

UNITED AIRCRAFT CORP EAST HARTFORD CONN

CATEGORY I AND II TEST REPORT FOR RUNWAY VISUAL RANGE
COMPUTING SETS. AN/FMN-1 (U)

FEB 63 IV
REPT. NO. WSC E 28
CONTRACT: AF19 626 16
MONITOR: ESD 1DR63 120

UNCLASSIFIED REPORT

DESCRIPTORS: *COMPUTERS, *RUNWAYS, DISPLAY SYSTEMS,
HUMAN FACTORS ENGINEERING, LANDING AIDS, MAINTENANCE,
METEOROLOGICAL INSTRUMENTS, NAVIGATIONAL AIDS, RANGE
FINDING, RELIABILITY (ELECTRONICS), TESTS (U)

CATEGORY I AND II TESTS ON RUNWAY VISUAL RANGE
COMPUTING SETS AN/FMN-1.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-402 145

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

A STUDY IN PROBABILISTIC INFORMATION PROCESSING
(PIP)

(U)

APR 63 IV KAPLAN, RICHARD J.; NEWMAN, J. ROBERT;
REPT. NO. TM1150 000 00
CONTRACT: AF19 628 1648

UNCLASSIFIED REPORT

DESCRIPTORS: •DECISION MAKING, •STATISTICAL ANALYSIS,
COMPUTERS, DATA PROCESSING, GAME THEORY, HUMAN FACTORS
ENGINEERING, PROBABILITY (U)

A STUDY IN PROBABILISTIC INFORMATION PROCESSING (PIP).

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-414 428

APPLIED PSYCHOLOGICAL SERVICES WAYNE PA

TECHNIQUES FOR EVALUATING OPERATOR LOADING IN MAN-MACHINE SYSTEMS. MODIFICATION AND FURTHER EVALUATION OF A DIGITAL MAN-MACHINE SIMULATION MODEL, (U)

JUL 63 59P WOLF, J. JAY ; SIEGEL, ARTHUR
1. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*MATHEMATICAL MODELS, DESIGN),
(*SIMULATION, REFUELING IN FLIGHT), (*COMPUTER,
PROGRAMMING), (*DATA, ANALYSIS), HUMAN FACTORS
ENGINEERING, INTERCEPTION, LAUNCHING, STRESS
(PSYCHOLOGY), REACTION (PSYCHOLOGY), REFLEXES, NUMERICAL
ANALYSIS, STOCHASTIC PROCESSES, STATISTICAL TESTS,
TESTS, DIGITAL COMPUTERS (U)
IDENTIFIERS: F-6 AIRCRAFT, SPARROW, SPARROW III (U)

A DIGITAL COMPUTER SIMULATION MODEL WAS PREVIOUSLY DERIVED AND EMPLOYED FOR SIMULATING THE PERFORMANCE OF THE OPERATOR(S) IN A MAN-MACHINE SYSTEM. THE TECHNIQUE IS BASED ON AN ANALYSIS OF THE PERFORMANCE OF EACH OPERATOR, ARRANGED INTO ORDERED, DISCRETE ACTIONS CALLED 'SUBTASKS,' AND THE COMPILATION FOR EACH OF CERTAIN SOURCE DATA. THESE DATA, TOGETHER WITH SELECTED PARAMETER VALUES (E.G., THE TIME ALLOTTED FOR TASK PERFORMANCE), ARE PLACED IN PUNCHED CARD FORM AND INTRODUCED INTO A DIGITAL COMPUTER WHICH SEQUENTIALLY SIMULATES, ACCORDING TO THE RULES OF THE MODEL, THE 'PERFORMANCE' OF EACH SUBTASK BY EACH OPERATOR. THE NORMAL SEQUENCE OF SUBTASKS MAY BE MODIFIED IF ACTIONS HAVE TO BE SKIPPED OR REPEATED DUE TO FAILURE OF A SUBTASK BY EITHER OPERATOR OR AS A RESULT OF OPERATOR DECISIONS. A SIMULATION IS COMPLETED WHEN THE OPERATORS EITHER USE ALL ALLOTTED TIME OR SUCCESSFULLY COMPLETE THE TASK. RESULTS ARE RECORDED INDICATING THE AREAS OF OPERATOR OVERLOAD, FAILURE, IDLE TIME, PEAK STRESS, ETC., FOR THE GIVEN SET OF SELECTED PARAMETERS. REPETITIONS OF THE SIMULATION, WITH DIFFERENT PARAMETER VALUES, YIELD A RANGE OF RECORDS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-415 147

ELECTRONIC SYSTEMS DIV L G. HANCOCK FIELD MASS

MONITORING OF SEQUENTIAL BINARY PATTERNS. (U)

MAY 63 3P JOHNSON, LAWRENCE ; POLLACK,
IRWIN ;
MONITOR: ESD TDR63 342

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPRINT FROM PERCEPTUAL AND MOTOR
SKILLS, 16, 911-913, 1963.

DESCRIPTORS: (*PERSONNEL, MONITORS), (*MONITORS, DISPLAY
SYSTEMS), (*DISPLAY SYSTEMS, SIGNALS), DIGITAL SYSTEMS,
PERFORMANCE(HUMAN.), DATA PROCESSING, TESTS,
SEQUENCES(MATHEMATICS), DIGITAL COMPUTERS, HUMAN FACTORS
ENGINEERING (U)

REPRINT ON MONITORING OF SEQUENTIAL BINARY PATTERNS.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-415 630

ILLINOIS UNIV URBANA

MONTE CARLO MODEL OF TRACKING BEHAVIOR. (U)

FEB 63 21F ADAMS, JACK A.; WEBER, CARL

E.;

CONTRACT: AF49 638 371

MONITOR: AFOSR J878

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPRINT FROM HUMAN FACTORS THE
JNL. OF THE HUMAN FACTORS SOCIETY, PP. 81-102,
1963.

DESCRIPTORS: (*TRACKING, SIMULATION), (*MONTE,
TRACKING), (*PSYCHOLOGY, TRACKING), (*MATHEMATICAL
MODELS, TRACKING), HUMAN FACTORS ENGINEERING, LEARNING,
DIGITAL COMPUT, DATA PROCESSING SYSTEMS. (U)

MONTE CARLO MODEL FOR SIMULATION OF HUMAN TRACKING
BEHAVIOR WITH A DIGITAL COMPUTER. REPRINT.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-417 680

FRANKLIN INST PHILADELPHIA PA LABS FOR RESEARCH AND
DEVELOPMENT

INFORMATION DISPLAY IN THE AIR TRAFFIC CONTROL
SYSTEM. A COORDINATED RESEARCH AND DEVELOPMENT
APPROACH,

(U)

MAR 62 IV BUCKLEY, EDWARD P.; GREEN,
THOMAS H.;
CONTRACT: FAA BRD423

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: ORIGINAL CONTAINS COLOR PLATES: ALL
DDC REPRODUCTIONS WILL BE IN BLACK AND WHITE. ORIGINAL
MAY BE SEEN IN DDC HQ.

DESCRIPTORS: (•AIR TRAFFIC CONTROL SYSTEMS, DISPLAY
SYSTEMS), (•DISPLAY SYSTEMS, HUMAN), (•AIR TRAFFIC
CONTROLLERS, DECISION MAKING), JOB ANALYSIS, AUTOMATION,
COMMUNICATION THEORY, STATISTICAL ANALYSIS. (U)
IDENTIFIERS: CODES, MAN MACHINE FUNCTION (U)

THIS PAPER PRESENTS A PLAN OF ATTACK ON THE PROBLEM
OF DISPLAYS FOR USE IN ADVANCED AIR TRAFFIC CONTROL
SYSTEMS. THE METHOD, KNOWN AS CODE ('CONTROLLER
DECISION EVALUATION'), CONSISTS OF THE
EXPERIMENTAL COMPARISON OF DISPLAY INFORMATION AND
FORMATS UNDER CONDITIONS OF SCOREABLE STATIC
SIMULATIONS. THE EXPERIMENTAL DISPLAYS ARE
SIMULATIONS OF RADAR SCOPES PROJECTED FROM FILM
STRIPS FOR MULTIPLE VIEWING. INDEPENDENT VARIABLES
ARE THE TYPE, AMOUNT, AND/OR LEVEL OF DETAIL OF
INFORMATION PRESENTED TO THE CONTROLLER; DEPENDENT
VARIABLES ARE SUCCESS IN PREDICTING CONFLICTIONS AND/
OR DELAYS. THE TECHNIQUE MAKES IT POSSIBLE TO
ASSESS THE EFFECTIVENESS OF ATC SYSTEMS WHICH AS
YET ARE ONLY VISUALIZED, AS WELL AS OF SYSTEMS NOW
BEING DEVELOPED OR IN ACTUAL OPERATION. TWO
EXPERIMENTS ARE REPORTED UTILIZING THE METHOD. AN
EXPERIMENTAL PROGRAM IS PRESENTED TO STUDY THE
EFFECTS OF PROGRESSIVELY ADVANCED DEGREES OF
AUTOMATED INFORMATION PROCESSING UPON CONTROLLER
DECISION-MAKING. A MATRIX IS PRESENTED SHOWING THE
STEPS TO BE TAKEN FOR THE ORDERLY DEVELOPMENT OF A
FULLY AUTOMATED SYSTEM. THE CODE EXPERIMENTS TO
BE PERFORMED PRIOR TO THE DEVELOPMENT OF EACH LEVEL
OF AUTOMATION, AS INDICATED IN THE MATRIX, ARE
DISCUSSED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-419 018

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

A METHODOLOGICAL APPROACH TO THE ANALYSIS AND
AUTOMATIC HANDLING OF TASK INFORMATION FOR SYSTEMS IN
THE CONCEPTUAL PHASE, (U)

AUG 63 120P REED, LAWRENCE E.; FOLEY,
JOHN B.; GRAHAM, RALPH S.; HILGEMAN, JONATHAN
B.;

PROJ: 1710

TASK: 171006

MONITOR: AMRL

TDR63 78

UNCLASSIFIED REPORT

DESCRIPTORS: (•JOB ANALYSIS, SCIENTIFIC RE), DATA
PROCESSING, HUMAN ENGI. BEHAVIOR, CODING,
TRAINING PERSONNEL, INFORMATION RETRIEVAL. (U)
IDENTIFIERS: HUMAN FACTORS ENGINEERING (U)

ADEQUATE CONSIDERATION OF THE HUMAN SKILLS REQUIRED BY FUTURE SYSTEMS HAS LONG BEEN NEGLECTED IN THE CONCEPTUAL PHASE OF MAN-MACHINE SYSTEM DEVELOPMENT. THIS NEGLECT IN PART HAS BEEN DUE TO LACK OF A UNIFORM AND WORKABLE METHOD FOR GATHERING, PROCESSING, AND USING EARLY HUMAN FACTORS INFORMATION FOR IMPROVING THE DESIGN AND DEVELOPMENT OF SYSTEMS. THE METHODOLOGICAL APPROACH PRESENTED IN THIS REPORT WAS PREDICATED ON THIS NEED. THIS REPORT PRESENTS A TECHNIQUE FOR ANALYZING AND PROCESSING TASK AND TASK REQUIREMENTS DATA GENERATED DURING THE CONCEPTUAL PHASE OF SYSTEM DEVELOPMENT. THE TECHNIQUE INCLUDES: (A) A CATEGORY SYSTEM FOR ORGANIZING, CLASSIFYING, AND CODING TASK INFORMATION; (B) A TASK ANALYSIS FORMAT FOR RECORDING AND CODING TASK DESCRIPTIONS AND TASK REQUIREMENTS; AND (C) COMPUTER UPDATE AND RETRIEVAL PROGRAMS. TASK REQUIREMENT DATA APPEARING IN DOCUMENTS RESULTING FROM THE AIR FORCE STUDY REQUIREMENT PROGRAM ARE ANALYZED AND USED FOR TESTING THE TECHNIQUE ON AN ACTUAL PERSONNEL TRAINING PROBLEM. THE TEST PROGRAM INDICATES THAT THE TECHNIQUE CAN BE USED TO ASSIST HUMAN FACTORS SPECIALISTS TO ISOLATE AND PROCESS TASK AND TASK REQUIREMENTS ASSOCIATED WITH ADVANCED SYSTEMS FOR MAKING PERSONNEL, TRAINING, AND TRAINING EQUIPMENT RECOMMENDATIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-419 254

BENDIX CORP ANN ARBOR MICH BENDIX SYSTEMS DIV

STUDY OF COMPUTER MANUAL INPUT DEVICES, (U)

SEP 63 IV POLLOCK, WILLIAM T.; GILDNER,
GILBERT G.;
REPT. NO. BSC40138
CONTRACT: AF19 628 435
PROJ: 9678
TASK: 967801
MONITOR: ESD TDR63 545

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMPUTERS, ENGINEERING), MAN S, HUMAN
FACTORS ENGINEERING, COMMUNICATION, PERFORMANCE (HUMAN),
ERRORS, BIBLIOG: DATA, ELECTRIC SWITCHES, SPEECH (U)

A STUDY OF COMPUTER MANUAL INPUT DEVICES AND THEIR
ASSOCIATED HUMAN ENGINEERING CHARACTERISTICS WAS
CONDUCTED FOR THE PURPOSE OF DEVELOPING A SCHEME FOR
RELATING THESE DEVICES TO OPERATOR PERFORMANCE
CHARACTERISTICS, COMPUTER CHARACTERISTICS AND SYSTEM
REQUIREMENTS. CONVENTIONAL COMMERCIALY AVAILABLE
INPUT DEVICES SUCH AS PUSHBUTTONS, TOGGLE SWITCHES,
JOYSTICKS, ETC. WERE SURVEYED. AVAILABLE
LITERATURE PERTAINING TO HUMAN PERFORMANCE WITH SUCH
DEVICES WAS REVIEWED AND SUMMARIZED. THE
SUITABILITY OF DEVICES AND AVAILABILITY OF APPLICABLE
PERFORMANCE DATA ARE RELATED TO A GENERALIZED
OPERATOR TASK FAMILY BY A SET OF TABLES. RESULTS
OF THE STUDY SHOW A WIDE VARIETY OF AVAILABLE
DEVICES, INADEQUATE RESEARCH DATA ESTABLISHING
PERFORMANCE FOR VARIOUS DEVICES AND DEVICE CHARACTER
ISTICS, AND INCOMPLETE SPECIFICATION OF OPERATOR
INPUT TASKS IN EXISTING SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHX13

AD-419 553

IBM WATSON RESEARCH CENTER YORKTOWN HEIGHTS N Y

APPLIED RESEARCH PROGRAM AEROSPACE INTELLIGENCE
DATA SYSTEM (AIDS). VOLUME 11 - CONSOLES.

(U)

DESCRIPTIVE NOTE: QUARTERLY REPT. NO. 4.

SEP 62 28P

CONTRACT: AF19 626 10

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING, COMPUTERS), TRANSDUCERS,
DISPLAY SYSTEMS, COMPUTER PROGRAMMING, COMPUTER LOGIC,
INPUT OUTPUT DEVICES, HUMAN FACTORS ENGINEERING,
DESIGN

(U)

SOME GENERAL CHARACTERISTICS OF CONSOLES WHEN USED
AS TRANSDUCERS BETWEEN HUMAN BEINGS AND INFORMATION
PROCESSING DEVICES ARE REVIEWED. TEST OF A
SPECIFIC CONSOLE DESIGNED FOR INDEPENDENT "OFF
LINE" USE, THE DATACOM MODEL 408-2 IS
DESCRIBED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-419 778

ARMY RESEARCH OFFICE WASHINGTON D C

EIGHTH ANNUAL ARMY HUMAN FACTORS ENGINEERING
CONFERENCE 16-19 OCTOBER 1962, UNITED STATES ARMY
INFANTRY CENTER AND UNITED STATES ARMY INFANTRY
SCHOOL, FORT BENNING, GEORGIA.

(U)

NOV 62 335P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, SYMPOSIA),
(*SYMPOSIA, HUMAN FACTORS ENGINEERING), ARMY RESEARCH,
CAMOUFLAGE, AUTOMATIC FAPONS, CHEMICAL WARFARE AGENTS,
PROTECTIVE CLOTHING, COMPUTERS, ACOUSTICS, REVIEWS, ARMY
EQUIPMENT (U)
IDENTIFIERS: BZ AGENTS (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-420 577

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

DEFINING LEVEL-OF-AUTOMATION FOR CHECKOUT EQUIPMENT.
A SCALING APPROACH, (U)

AUG 63 17P TOPMILLER, DONALD A. ;
PROJ: AF7184
TASK: 718406
MONITOR: MRL TDR63 76

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN PERFORMANCE IN
ADVANCED SYSTEMS.

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, AUTOMATION),
(*ENGINEERS, PERFORMANCE(HUMAN)), (*PERCEPTION,
PERSONNEL), TEST EQUIPMENT, SOCIAL COMMUNICATION (U)

IN AN ATTEMPT TO DETERMINE IF DIFFERENT
PROFESSIONAL GROUPS USE DIFFERING SUBJECTIVE SCALES
FOR DEFINING 'LEVEL OF AUTOMATION' OF CHECKOUT
EQUIPMENT, 19 ENGINEERING PSYCHOLOGISTS AND 19 DESIGN
ENGINEERS WERE ADMINISTERED A PAIRED COMPARISONS
JUDGMENT TASK CONSISTING OF CARDS CONTAINING PHASES
INDICATING VARIOUS LEVELS OF MAN-MACHINE AUTOMATION.
THE RESULTING SCALED RESPONSES FOR BOTH GROUPS
CONTAINED RANK-ORDER INVERSIONS OF AN ORIGINAL
INTUITIVELY DEVELOPED SCALE. INTERVALS BETWEEN
SCALE POINTS ALSO DIFFERED BETWEEN THE GROUPS. AS A
RESULT OF THESE FINDINGS, IF AIR FORCE
REQUIREMENTS ARE SPECIFIED FOR AUTOMATION LEVEL OF
CHECKOUT EQUIPMENT IN WEAPON SYSTEMS DEVELOPMENT
PROGRAMS, THE TYPE OF RATERS INVOLVED AND THE
ASSOCIATED POTENTIAL PROBLEMS OF INTERDISCIPLINARY
COMMUNICATIONS BETWEEN PROFESSIONS SHOULD BE
CONSIDERED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-422 432

ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y

PROCEEDINGS OF SYMPOSIUM ON HUMAN FACTOR ASPECTS OF
PHOTO INTERPRETATION.

(U)

SEP 63 138P

PROJ: 4244

MONITOR: RADC

TDR63 324

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•SYMPOSIA, PHOTO INTERPRETATION), (•PHOTO
INTERPRETATION, SYMPOSIA), (•HUMAN FACTORS ENGINEERING,
PHOTO INTERPRETATION), TRAINING, AUTOMATION,
PHOTOGRAPHIC IMAGES, QUALITY CONTROL, AERIAL
PHOTOGRAPHY, RESOLUTION

(U)

IDENTIFIERS: HUMAN FACTORS ENGINEERING

(U)

CONTENTS: THE AUTOMATION OF PHOTO
INTERPRETER FUNCTIONS; HUMAN FACTOR
PROBLEMS: OBJECTIVES AND APPROACHES;
MEASUREMENT AND EVALUATION OF GROUND
RESOLUTION; QUALITY CATEGORIZATION OF AERIAL
PHOTOGRAPHY; PSYCHOPHYSICAL ASPECTS OF IMAGE
QUALITY; A STUDY OF IMAGE QUALITIES AND
SPEEDED INTRINSIC TARGET RECOGNITION;
FACTORS AFFECTING CHANGE DISCRIMINATION,
RESEARCH ON THE RELATIONSHIP BETWEEN TIM AND
PI PERFORMANCE; APPLICATION OF RAPID
PRESENTATION TECHNIQUES IN PHOTO
INTERPRETATION; PHOTO INTERPRETATION COURSES
TAUGHT AT SHEPPARD AFB, TEXAS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-422 476

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

SCHEMATIC SIMULATION: A TECHNIQUE FOR THE DESIGN AND
DEVELOPMENT OF A COMPLEX SYSTEM, (U)

SEP 63 11P ALEXANDER, L. T. ;
REPT. NO. SR TM639 005 00

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*AIR TRAFFIC CONTROL SYSTEMS, TERMINAL
FLIGHT FACILITIES), (*OPERATIONS RESEARCH, AIR TRAFFIC
CONTROL SYSTEMS), RESEARCH MANAGEMENT, COMMUNICATION
SYSTEMS, DATA PROCESSING, SIMULATION, TEST METHODS,
CIVIL AVIATION, HUMAN FACTORS ENGINEERING (U)

SCHEMATIC SIMULATION IS THE NAME OF A METHOD FOR
STUDYING SYSTEM SPECIFICATIONS AND EXPLICATING
IMPLICATIONS OF THE SPECIFICATIONS FOR SUBSYSTEM
DESIGN. THE METHOD WAS DEVELOPED IN RESPONSE TO THE
EXPRESSED NEED OF THE DESIGNERS OF THE TERMINAL
AIR TRAFFIC CONTROL (TATC) LABORATORY SYSTEM.
THE METHOD PROVIDES A MODEL OF THE PROJECTED SYSTEM
AND A PROCEDURE BY WHICH THE DESIGNERS CAN VIEW
SYSTEM OPERATIONS FROM THE STANDPOINT OF THE EVENTUAL
OPERATORS. AN ILLUSTRATION IS GIVEN OF HOW
SCHEMATIC SIMULATION WAS USED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-422 852

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

TERMINAL AIR TRAFFIC CONTROL FOLLOW-ON RESEARCH, (U)

SEP 63 10P ALEXANDER, L. T. ;

REPT. NO. TM639 007 00

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*AIR TRAFFIC CONTROL SYSTEMS, OPERATIONS RESEARCH), RESEARCH MANAGEMENT, TERMINAL FLIGHT FACILITIES, MODEL (SIMULATIONS), MODEL TESTS, DATA PROCESSING, DIGITAL COMPUTERS, SCHEDULING, AUTOMATION, TEST METHODS, HUMAN FACTORS ENGINEERING (U)

A PLAN IS PRESENTED FOR INVESTIGATION MAN-COMPUTER INFORMATION EXCHANGE PROBLEMS WITHIN THE CONTEXT OF THE SCHEDULING FUNCTION IN TERMINAL AIR TRAFFIC CONTROL THE PLANNED RESEARCH IS DIVIDED INTO TWO STAGES. THE FIRST CONSISTS OF PARALLEL INVESTIGATIONS OF HUMAN SCHEDULING BEHAVIOR AND THE DEVELOPMENT OF COMPUTER PROGRAMS TO AUTOMATE THE PROCESS. THE SECOND STAGE AIMS AT DESIGNING A SCHEDULING SYSTEM WHICH INCORPORATES DYNAMIC INTERACTION IN REAL TIME BETWEEN THE COMPUTER PROGRAMS AND HUMAN OPERATORS. THE PROGRAMS REQUIRED TO AUTOMATE THE SCHEDULING FUNCTION ARE DESCRIBED AND EXPERIMENTAL STUDIES OF HUMAN CONFLICT DETECTION AND CONFLICT RESOLUTION BEHAVIOR ARE SUGGESTED. A MORE GENERAL STATEMENT OF HUMAN SCHEDULING BEHAVIOR IS PRESENTED TOGETHER WITH AN APPROACH WHICH UTILIZES AN ABSTRACTED ENVIRONMENT AND TASK RATHER THAN THE AIR TRAFFIC CONTROL CONTEXT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-422 853

SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

TEST RESULTS OF THE TERMINAL AIR TRAFFIC CONTROL
LABORATORY SYSTEM, (U)

SEP 63 27P COOPERBAND, A. S. ; ALEXANDER,
L. T. ; SCHMITZ, H. S. ;
REPT. NO. TM639 040 00

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (AIR TRAFFIC CONTROL SYSTEMS, OPERATIONS
RESEARCH), SCHEDULING, MODELS (SIMULATIONS), DATA
PROCESSING, DIGITAL COMPUTERS, MODEL TESTS, TEST
METHODS, TABLES (DATA), RESEARCH MANAGEMENT, TERMINAL
FLIGHT FACILITIES, HUMAN FACTORS ENGINEERING (U)

THE TERMINAL AIR TRAFFIC CONTROL (TATC)
PROJECT REPRESENTS AN ATTEMPT TO PRODUCE IN THE
LABORATORY THE PHENOMENA WHICH OCCUR IN MAN-MACHINE,
INFORMATION-PROCESSING SYSTEMS. THE ESSENTIAL
ASPECT OF THE PROCEDURE IS TO CREATE THE COMPLEX
ENVIRONMENT WITHIN WHICH SUCH SYSTEMS OPERATE, TO
MANIPULATE THIS ENVIRONMENT, AND TO OBSERVE HOW THE
SYSTEM RESPONDS IN AN EFFORT TO ACHIEVE ITS MISSION.
THE INSTRUMENT WHICH MAKES THIS TECHNIQUE POSSIBLE
IS THE HIGH-SPEED DIGITAL COMPUTER, FOR ONLY THROUGH
ITS USE CAN THESE COMPLEX ENVIRONMENTS BE SIMULATED,
MANIPULATED, AND CONTROLLED. THE RESULTS OF THE
EXPERIENCE WITH TATC INDICATE THAT SIGNIFICANT
SYSTEM PHENOMENA CAN BE STUDIED IN THE LABORATORY
THEREBY CONTRIBUTING TO THE DEVELOPMENT OF A SCIENCE
OF SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-424 284

BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

THE SYSTEM SYSTEM AND BRIDGES OVER THE GULF BETWEEN
MAN-MACHINE-SYSTEM RESEARCH AND MAN-MACHINE-SYSTEM
DEVELOPMENT, (U)

JAN 62 3GP LICKLIDER, J. C. R. ;
CONTRACT: AF49 638 355
MONITOR: AFOSR 1673

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•OPERATIONS RESEARCH, COMPUTERS), (•HUMAN
FACTORS ENGINEERING, DESIGN), COMPUTERS, SCIENTIFIC
RESEARCH, COMMUNICATION THEORY, MODELS (SIMULATIONS),
OPERATION, MATHEMATICAL MODELS (U)
IDENTIFIERS: MIDAS, PERT, SAGE, SYSTEMS ANALYSIS,
TIROS (U)

THE NEED FOR GREATER COHERENCE IN THE MANMACHINE
AND OTHER HIGH-ORDER INTERACTIONS OF OUR MAJOR
SYSTEMS IS DESCRIBED, AND AN APPROACH TO ACHIEVEMENT
OF THAT COHERENCE IS PROPOSED. THE APPROACH
INVOLVES A COMPUTER-CENTERED META-SYSTEM (THE
'SYSTEM SYSTEM') DESIGNED TO FACILITATE
COMMUNICATION, COORDINATION, AND PROBLEM-SOLVING.
THE NEEDS FOR, AND ROLES OF, SUCH A META-SYSTEM IN
VARIOUS PHASES OF SYSTEM DESIGN, DEVELOPMENT,
PRODUCTION, AND OPERATION ARE DISCUSSED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-424 905

MITRE CORP BEDFORD MASS

MAN-COMPUTER INFORMATION TRANSFER,

(U)

63 6P SMITH, SIDNEY L. :

CONTRACT: AF19 628 39852

MONITOR: ESD TOR63 498

UNCLASSIFIED REPORT

REPRINT FROM ELECTRO-TECHNOLOGY, AUG 63.

(COPIES NOT SUPPLIED BY DDC)

SUPPLEMENTARY NOTE: NO FOREIGN.

DESCRIPTORS: (•DATA PROCESSING, HUMAN ENGINEERING),
COMPUTERS, DESIGN, DISPLAY SYSTEMS, LANGUAGE, CODING (U)

IDENTIFIERS: INFORMATION PROCESSING (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-428 839
MITRE CORP BEDFORD MASS

FIRST CONGRESS ON THE INFORMATION SYSTEM SCIENCES
SESSION 15 INFORMATION SYSTEM PERFORMANCE
EVALUATION.

(U)

JAN 64 59P
REPT. NO. SS15
CONTRACT: AF33 600 39852
PROJ: 7040
MONITOR: ESD TDR63 474 15

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SYMPOSIA, INFORMATION RETRIEVAL), (*DATA
PROCESSING, OPERATION), EFFECTIVENESS, TRAINING, DESIGN,
DECISION MAKING, SIMULATION, ANALYSIS, PERSONNEL,
CONTROL, PERFORMANCE(HUMAN), VISIBILITY, OPERATOR
(PERSONNEL), HUMAN FACTORS ENGINEERING, JOB ANALYSIS (U)
IDENTIFIERS: INFORMATION SCIENCES, INFORMATION
SYSTEMS, SAGE, SYSTEMS (U)

THIS SESSION DEALS WITH THE PROBLEMS OF EVALUATING
THE PERFORMANCE OF A MILITARY INFORMATION PROCESSING
SYSTEM BETWEEN THE TIME IT IS DEvised AND THE TIME
WHEN IT IS OBSOLETE. THE SESSION IS TRIPARTITE,
DEALING WITH (1) THE CRITERIA INVOLVED IN JUDGING
PERFORMANCE EFFECTIVENESS OF SYSTEMS, (2) THE USE
OF THE ADCS TRAINING PROGRAM IN SYSTEM
PERFORMANCE EVALUATION, AND (3) THE APPLICATION
OF NORMATIVE EXERCISING AS A SYSTEM DESIGN AID.
IN CONSIDERING THE PROBLEM OF ESTABLISHING CRITERIA
BY WHICH TO EVALUATE SYSTEMS, THE THREE VARIABLES
(ENVIRONMENTAL CONDITIONS, THE STATE OF THE SYSTEM,
AND A KNOWLEDGE OF THE PROBABLE CONSEQUENCES OF
ALTERNATIVE ACTION) WHICH IMPORTANTLY INFLUENCE
PERFORMANCE ARE DESCRIBED. THE EFFICACY OF
NORMATIVE EXERCISING AS AN ANALYTICAL AID OF
DESIGN PURPOSES IN THE EARLY STAGES OF A PARTICULAR
SYSTEM'S EVALUATION IS INDICATED, PARTICULARLY WHEN
CRITERIA ARE LACKING WITH WHICH TO TEST OUTCOMES OF
SYSTEM FUNCTION, WHEN THERE ARE MANY CONFLICTING
VIEWS AS TO HOW TO ARRIVE AT A PROBLEM SOLUTION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-429 897

RAND CORP SANTA MONICA CALIF

ON THE EXPLOSION OF AUTOMATION,

(U)

FEB 64 5P BELLMAN, RICHARD ;
REPT. NO. P2865

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, AUTOMATION),
(*AUTOMATION, PUBLIC OPINION), (*COMPUTERS, SOCIAL
SCIENCE), DECISION MAKING, DESIGN, DIGITAL
COMPUTERS

(U)

REVIEW OF EXPLOSION OF AUTOMATION. IMPROVEMENTS IN
COMPUTERS. IMPACT OF AUTOMATION ON EMPLOYEES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-430 035

DUNLAP AND ASSOCIATES INC DARIEN CONN

MAN-COMPUTER SYSTEMS AND ALLOCATION OF RESOURCES
PROBLEMS.

(U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 3.

JAN 64 72P

GAGLIARDI, U. O. ; KAPLAN, IRA

; VALLERIE, L. L. ;

CONTRACT: NONR3602 00

TASK: NONR360300

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*BEHAVIOR, DECISION MAKING), (*HUMAN
FACTORS ENGINEERING, WEAPON SYSTEMS), (*JOB ANALYSIS,
LINEAR PROGRAMMING), AUTOMATION, MOBILE, MANNED,
COMPUTERS, EYE, MOTION, AUTOMATIC, TARGETS, MAPPING,
DETECTION, PERFORMANCE TESTS, CAMERAS, TARGET
RECOGNITION, DIGITAL COMPUTERS, TARGET DISCRIMINATION,
DATA PROCESSING, SUBMARINES (U)

IDENTIFIERS: HEURISTIC PROGRAM, POLARIS,
SYMBIOSIS (U)

THE WORK REPORTED CONCERNS THE OBSERVATION OF
PROBLEM-SOLVING BEHAVIOR EXHIBITED BY SUBJECTS WHO
WERE GIVEN AN ALLOCATION-OF-RESOURCES TASK. THE
TASK WAS TO DEPLOY POLARIS-LIKE WEAPON SYSTEMS
AGAINST A GIVEN TARGET SYSTEM UNDER STATED
CONSTRAINTS. WHILE THE TASK IS FORMULABLE AS AN
INTEGER LINEAR PROGRAMMING PROBLEM, THE SUBJECTS
SOLVED IT BY RESORTING TO HEURISTIC PROCEDURES.
THESE PROCEDURES, AS WELL AS THE SOLUTIONS
PRODUCED, SEEM TO INDICATE THAT A PROBLEM SOLVER MAY
ENCOUNTER CONSIDERABLE DIFFICULTY IN UNCOVERING THE
ORDERING OF DECISION ALTERNATIVES, IF THIS ORDERING
IS A PARTIAL ONE. FOLLOWING THE STUDY OF UNAIDED
PERFORMANCE, TWO DISTINCT COMPUTER-AID CONCEPTS WERE
DEVELOPED AND TESTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-431 611

PHILCO NEWPORT BEACH CALIF AERONUTRONIC DIV

HUMAN FACTORS ASPECTS OF RELIABILITY.

(U)

DESCRIPTIVE NOTE: FINAL REPT., 1 JULY 62-30 SEP 63,
JAN 64 205P MILLER, GILBERT E. ; MAXWELL,
RICHARD A. ; FERGUSON, LINDA ; GALBO, CHARLES J.

REPT. NO. U2296

CONTRACT: DA36 0395C90877

PROJ: 3A95 20 001

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (HUMAN FACTORS ENGINEERING, RELIABILITY),
WEAPON SYSTEMS, PERCEPTION, VISUAL ACUITY, STRESSES,
MATHEMATICAL MODELS, SAMPLING, SIMULATION,
PERFORMANCE (HUMAN), DIGITAL COMPUTERS, COMPUTERS,
PROGRAMMING (COMPUTERS), PUNCHED CARDS, INPUT OUTPUT
DEVICES

(U)

IDENTIFIERS: TASK EQUIPMENT ANALYSIS

(U)

THIS DOCUMENT PRESENTS THE FINAL REPORT OF THE HUMAN FACTORS ASPECTS OF RELIABILITY PROGRAM OF RESEARCH. THE REPORT CONTAINS A REVIEW OF THE LITERATURE RELATED TO THIS PROJECT, A REVIEW OF THE BASIC METHODOLOGY DEVELOPED FOR PREDICTING MAN-MACHINE SYSTEM RELIABILITY, A REPORT OF THE RESULTS OF THE APPLICATION OF THE METHODOLOGY IN SIGNAL CORPS R+D PROGRAMS, AND THE RELATIONSHIP OF THE STUDY TO PRESENT SIGNAL CORPS HUMAN FACTORS AND RELIABILITY TECHNICAL REQUIREMENTS. THE PROCEDURES FOR GENERATING TASK EQUIPMENT ANALYSIS (TEA) DATA AND THE MEANS OF TRANSLATING THESE DATA TO INPUT DATA FOR THE PREDICTIVE MODEL ARE PRESENTED. THE MANNER IN WHICH THE TEA DATA WERE CONVERTED TO INPUT DATA IS PRESENTED IN THE APPENDIX. ALTERNATIVE APPROACHES INVESTIGATED DURING THE COURSE OF THIS STUDY ARE DISCUSSED. THE METHODOLOGICAL APPROACH AND THE MATHEMATICS UTILIZED IN DERIVING THE PREDICTIVE MODEL AND THE PROGRAM FOR FORMULATION ARE PRESENTED IN DETAIL IN THE REPORT. THE MANNER IN WHICH THE PROGRAM OUTPUT SUMMARIES AND THE DETAILED PROGRAM LISTINGS OF SIMULATION RUNS CAN BE UTILIZED ARE ALSO DISCUSSED AND DESCRIBED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-432 028

DUNLAP AND ASSOCIATES INC DARIEN CONN

HUMAN FACTORS TECHNOLOGY IN THE DESIGN OF SIMULATORS
FOR OPERATOR TRAINING, (U)

DEC 63 196P SMODE, ALFRED F. ; GRUBER,
ALIN ;
CONTRACT: N61339-1103
MONITOR: NAVTRADEVCE 1103-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, TRAINING
DEVICES), (*FLIGHT SIMULATORS, DESIGN), (*TRAINING,
OPERATORS (PERSONNEL)), (*TRAINING DEVICES, WEAPON
SYSTEMS), SIMULATION, PERFORMANCE(HUMAN), MEASUREMENT,
JOB ANALYSIS, STANDARDS, SPECIFICATIONS, TESTS,
EFFECTIVENESS, LEARNING, TABLES(DATA), TEST METHODS,
VISION, PERCEPTION, ENVIRONMENTAL TESTS, DISPLAY,
BEHAVIOR, COMPUTERS (U)

THIS REPORT PRESENTS AN ORGANIZED BODY OF
INFORMATION USEFUL FOR DEALING WITH THOSE HUMAN
FACTORS PROBLEMS FREQUENTLY ENCOUNTERED IN THE
DEVELOPMENT OF THE WEAPONS SYSTEM TRAINER.
EMPHASIS IS GIVEN THROUGHOUT TO THE GENERAL
PROBLEMS INVOLVED IN DEVELOPING THE COMPLETE TRAINING
SYSTEM RATHER THAN TO THE ANALYSIS OF DETAILS
SPECIFIC TO GIVEN TRAINING SYSTEMS. IT SUMMARIZES
BASIC HUMAN FACTORS INFORMATION WHICH INFLUENCES THE
DESIGN AND CONSTRUCTION OF TRAINING DEVICES.
SUCCESSIVE CHAPTERS OF THE REPORT ARE DEVOTED TO
DETERMINING TRAINING NEEDS, DEVELOPING THE
ENVIRONMENT FOR LEARNING, UNDERSTANDING SIMULATION
REQUIREMENTS FOR TRAINING, DEVELOPING A MEASUREMENT
CAPABILITY, AND DISCUSSING THE HUMAN ENGINEERING
PROBLEMS IN TRAINER DESIGN. AS IT PROVIDES A
CONSIDERABLE BACKGROUND OF HUMAN FACTORS INFORMATION
PERTINENT TO THE SYNTHETIC GROUND ENVIRONMENT, THIS
REPORT WILL BE OF INTEREST TO INDIVIDUALS DIRECTLY
CONCERNED WITH WEAPONS SYSTEM TRAINING
PROGRAMS, PREPARING TRAINER SPECIFICATIONS,
DEVELOPING TRAINING STANDARDS, AND TESTING AND
EVALUATING SIMULATION EQUIPMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-432 826

AEOSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

CONTROL OF A DISCRETE STOCHASTIC PROCESS AS A
FUNCTION OF THE COSTS FOR MAKING CORRECTIVE
ACTIONS.

(U)

DESCRIPTIVE NOTE: REPT. FOR DEC 61-FEB 62,
DEC 63 17P HORNSETH, JOHN P. ; HUEBNER,
WALTER J. ; PEARSON, WILLIAM H. ;
PROJ: 7184
TASK: 718403
MONITOR: AMRL TDR63 111

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON HUMAN PERFORMANCE IN
ADVANCED SYSTEMS.

DESCRIPTORS: (•STOCHASTIC PROCESS, HUMAN FACTORS
ENGINEERING), PERFORMANCE(HUMAN), COSTS, CONTROL,
DESIGN, TOLERANCES (PHYSIOLOGY), ERRORS, AUTOMATION,
MODELS (SIMULATIONS), PROBABILITY, ANALYSIS OF
VARIANCE

(U)

THIS RESEARCH EXAMINES MAN'S ABILITY TO CONTROL A
DISCRETE STOCHASTIC PROCESS. THE COST (C1) FOR
CORRECTING THE PROCESS BEFORE IT EXCEEDED AN
ARBITRARY TOLERANCE LIMIT SERVED AS THE EXPERIMENTAL
VARIABLE. THE COST (C2) FOR CORRECTING THIS
PROCESS AFTER IT EXCEEDED THE TOLERANCE LIMIT WAS
FIXED. FOR LOW C1 COSTS THE HUMAN CONTROLLER
ACHIEVED OPTIMUM CONTROL (I.E., MINIMIZED CONTROL
COST) WITHIN FOUR 100-CYCLE TRIALS. FOR HIGH
C1 COSTS THE HUMAN CONTROLLER ACHIEVED A LEVEL OF
CONTROL EQUIVALENT TO THAT OF THE OPTIMUM CONTROLLER
ON THE FIRST 100-CYCLE TRIAL. AN ADDITIONAL
REQUIREMENT TO SERVE AS A STATISTICAL SENSOR WAS
IMPOSED IN CONTROLLING THE PROCESS UNDER LOW C1
COST CONDITIONS. THE HUMAN CONTROLLER'S RESPONSE
TO THIS REQUIREMENT WAS APPROPRIATE. THE
IMPLICATIONS OF THESE RESULTS TO THE DESIGN OF
DISCRETE STOCHASTIC PROCESS CONTROLLERS IS DISCUSSED.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-435 022

CORNELL AERONAUTICAL LAB INC BUFFALO N Y

HUMAN TRACKING ABILITY FOR MAXIMUM TERRAIN
FOLLOWING.

(U)

DESCRIPTIVE NOTE: QUARTERLY TECHNICAL REPT. NO. 4, 1

MAR31 MAY 63,

MAY 63 55P RUBY, W. J. ;

REPT. NO. 1H1715E4

CONTRACT: N6001958660

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON PROJECT DIRECT.

DESCRIPTORS: (*TERRAIN AVOIDANCE, AIRCRAFT), (*PILOTS,
TERRAIN AVOIDANCE), LOW ALTITUDE, FLIGHT PATHS, DISPLAY
SYSTEMS, HUMAN FACTORS ENGINEERING, COMPUTERS,
PENETRATION, PROGRAMMING (COMPUTERS), MATHEMATICAL
ANALYSIS, TRACKING, TEST METHODS, SIMULATION (U)

THE PRIMARY OBJECTIVE OF THE AREA OF EFFORT CALLED
TERRAIN AVOIDANCE IS TO PROVIDE A FLIGHT
CAPABILITY AT SUFFICIENTLY LOW CLEARANCE ALTITUDES
ABOVE THE TERRAIN THAT THE PENETRATING AIRCRAFT WILL
BE PROTECTED FROM GROUND-BASED OR AIRBORNE ENEMY
WEAPONS SYSTEMS BY TAKING ADVANTAGE OF THE MASKING
AFFORDED DUE TO THE HEIGHT VARIATIONS OF THE TERRAIN.
(AUTHOR) (U)

UNCLASSIFIED

CDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-437 588

HUMAN SCIENCES RESEARCH INC MCLEAN VA

INFORMATION-PROCESSING TASKS IN TACTICAL ACTION
SELECTION: PERFORMANCE OF EXPERIENCED SUBMARINE
OFFICERS IN WEIGHTING MULTIPLE CRITERIA FOR DEPTH
SELECTION.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FOR JAN 62-MAR 64,
MAR 64 15CP VAUGHAN, W. S. , JR.;
VIRNELSON, T. R. ; FRANKLIN, R. D.;
REPT. NO. HSR-RR-63/26-AE
CONTRACT: NONR367100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DATA PROCESSING, JOB ANALYSIS),
(*SUBMARINE PERSONNEL, OFFICER PERSONNEL), HUMAN FACTORS
ENGINEERING, SELECTION, PERFORMANCE(HUMAN)

(U)

THE PROBLEM OF HOW TO ALLOCATE TASKS BETWEEN MEN
AND EQUIPMENT COMPONENTS OF A COMMAND AND CONTROL
SYSTEM IS ADDRESSED. SPECIFIC
INFORMATION PROCESSING STEPS INVOLVED IN THE SELECTION
OF A COURSE OF ACTION FROM AMONG ALTERNATIVES ARE
DEFINED AS THE TASKS TO BE ALLOCATED IN A MAN/
COMPUTER PARTNERSHIP. PERFORMANCE DATA REFLECTING
THE ABILITY OF EXPERIENCED TACTICAL COMMANDERS TO
PERFORM EACH OF THESE FIVE INFORMATION-PROCESSING
TASKS SINGLY AND IN COMBINATION ARE REQUIRED AS A
PART OF THE DATA BASE FOR ALLOCATION DECISION. THE
RESULTS INDICATE THAT ALTHOUGH INDIVIDUAL COMMANDERS
DIFFER FROM ONE ANOTHER IN THE IMPORTANCE THEY ATTACH
TO A SET OF DEPTH SELECTION CRITERIA, ANY ONE OFFICER
IS HIGHLY CONSISTENT OF HIS JUDGMENTS OF IMPORTANCE
AND THESE JUDGMENTS ARE STABLE OVER TIME AND
SENSITIVE TO DIFFERENCES IN THE TACTICAL SITUATION.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-453 887

RAND CORP SANTA MONICA CALIF

ANALYSIS FOR MILITARY DECISIONS.

(U)

NOV 64 382P QUADE, E. S. ;

REPT. NO. R387PR

CONTRACT: AF49 638 700

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DECISION MAKING, AIR FORCE RESEARCH),
DEFENSE SYSTEMS, SYSTEMS ENGINEERING, OPERATIONS
RESEARCH, GAME THEORY, MATHEMATICAL MODELS, STRATEGIC
WARFARE, LANDING FIELDS, JET FIGHTERS, USSR, DEPLOYMENT,
JET BOMBERS, COSTS, REASONING, HUMAN FACTORS
ENGINEERING, COMPUTERS

(U)

CONTENTS: ANALYSIS FOR AIR FORCE
DECISIONS, THE SELECTION AND USE OF
STRATEGIC AIR BASES, THE WHY AND HOW OF
MODEL BUILDING, THE RELEVANCE OF COSTS,
ANALYSIS AND DESIGN OF CONFLICT SYSTEMS,
ASSUMPTIONS ABOUT ENEMY BEHAVIOR, GAMING
METHODS AND APPLICATIONS, STRATEGIES FOR
DEVELOPMENT, MATHEMATICS AND SYSTEMS
ANALYSIS, THE USE OF COMPUTERS, COSTING
METHODS, PITFALLS IN SYSTEMS ANALYSIS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-465 851

NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF

METHOD DEVELOPMENT FOR BASIC TECHNICAL SKILLS
RESEARCH.

(U)

DESCRIPTIVE NOTE: PROGRESS REPT.,
MAY 65 19P SILVERMAN, JOE ; CARR, MALCOLM

J. ;

REPT. NO. SRR-65-4

PROJ: PF-16011001

TASK: 3 1605 03 0151

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•NAVAL PERSONNEL, MANPOWER), JOB ANALYSIS,
HUMAN FACTORS ENGINEERING, MILITARY REQUIREMENTS, DATA
PROCESSING, COMPUTER PROGRAMMING, MANAGEMENT PLANNING
AND CONTROL (U)

RESEARCH IS BEING CONDUCTED TO DEVELOP A METHOD FOR
DETERMINING TECHNICAL SKILLS REQUIRED FOR CURRENT AND
FUTURE WEAPONS AND SUPPORT SYSTEMS. IT IS TO SERVE
AS A BASIS FOR THE NAVY ENLISTED PERSONNEL
CLASSIFICATION STRUCTURE REQUIRED IN THE NEXT DECADE.
THE APPLICATION OF A MULTIDIMENSIONAL APPROACH TO
OCCUPATIONAL ANALYSIS WAS EXPLORED. THIS METHOD
INVOLVES THE ANALYSIS OF TASK PATTERNS IN TERMS OF
THE TECHNICAL, ORGANIZATIONAL, AND
COMMUNICATIONAL DIMENSIONS OF THE WORK SITUATION.
THE ACRONYM SAMOA (SYSTEMATIC APPROACH TO
MULTIDIMENSIONAL OCCUPATIONAL ANALYSIS) HAS
BEEN ADOPTED AS A LABEL FOR THIS METHOD. AN
ITERATIVE COMPUTER CLUSTERING PROGRAM WAS DEvised TO
GROUP SIMILAR TASK PATTERNS INTO HOMOGENEOUS
OCCUPATIONAL SEGMENTS. A METHOD OF DETERMINING
SKILL LEVELS WITH HIGH RELIABILITY WAS DEVELOPED TO
CLASSIFY TASKS INTO A HIERARCHY OF DIFFICULTY AND
COMPLEXITY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-467 356

PENNSYLVANIA UNIV PHILADELPHIA MOORE SCHOOL OF
ELECTRICAL ENGINEERING

A PROBLEM SOLVING FACILITY.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT., APR 63-JUL 65,
JUL 65 62P WEXELBLAT, RICHARD L. ;
REPT. NO. 66-02
CONTRACT: NONR55148

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DECISION MAKING, COMPUTERS), (*REASONING,
COMPUTERS), REAL TIME, INFORMATION RETRIEVAL, COMPUTER
PROGRAMMING, PROGRAMMING LANGUAGES, COMPUTER STORAGE
SYSTEMS, DATA STORAGE SYSTEMS, LEARNING, COMPUTER LOGIC,
DIGITAL COMPUTERS, HUMAN FACTORS ENGINEERING (U)
IDENTIFIERS: ASSOCIATIVE STORAGE, ON-LINE SYSTEMS (U)

THE OBJECTIVE OF THE REPORTED WORK IS TO SET UP A
COMPUTER WITH A LARGE MEMORY FOR ON-LINE, REAL TIME
USE TO AID IN HUMAN PROBLEM SOLVING, COMBINING THE
COMPUTATIONAL ABILITIES OF THE COMPUTER AND ITS
ABILITY TO STORE, RETRIEVE AND MANIPULATE LARGE
MASSES OF DATA. INFORMATION RETRIEVAL PROGRAMS USE
MULTILIST TECHNIQUES TO SIMULATE AN ASSOCIATIVE
MEMORY. MULTILANG, THE EXECUTIVE LANGUAGE, SERVES
BOTH AS A CONTROL LANGUAGE AND AS A PROGRAMMING
LANGUAGE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-475 376 9/2 5/1 5/8
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

A STUDY OF SOME SOFTWARE PARAMETERS IN TIME-SHARING
SYSTEMS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
65 147P GRIMES, FRED M. ;OTTO,
RONALD E. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMPUTER PROGRAMMING, SCHEDULING),
MANAGEMENT ENGINEERING, TIME STUDIES, COMPUTERS,
SIMULATION, MATHEMATICAL ANALYSIS, DATA PROCESSING,
HUMAN FACTORS ENGINEERING, OPTIMIZATION, ERRORS,
COMPUTER PERSONNEL, COMPUTER OPERATORS, CONFIGURATION,
EFFECTIVENESS (U)
IDENTIFIERS: FORTRAN, COMPUTER PROGRAMS (U)

A REVIEW IS MADE OF SOME EXISTING TIME-SHARING
COMPUTER SYSTEMS AND AN EXPLORATION OF VARIOUS
SOFTWARE CHARACTERISTICS IS CONDUCTED. THIS
INVESTIGATION IS CONDUCTED USING A COMPUTER PROGRAM
WITH WHICH A TYPICAL TIME-SHARING SYSTEM CAN BE
SIMULATED. THE BASIC SYSTEM PARAMETERS EXAMINED
ARE: (1) THE METHOD OF DETERMINING THE QUANTUM
TIME FOR EACH USER PER RESPONSE CYCLE, (2) THE
LENGTH OF THE DESIRED RESPONSE CYCLE, (3) THE
NUMBER OF REMOTE STATIONS PERMITTED AND (4) THE
MAXIMUM NUMBER OF USERS PERMITTED IN THE QUEUE AT ONE
TIME. THE RESULTS OF THESE SIMULATION RUNS ARE
PRESENTED. THE EFFECTS OF THE VARIOUS PARAMETERS
UPON THE AVERAGE RESPONSE CYCLE TIME, THE AVERAGE
NUMBER IN THE QUEUE AWAITING SERVICE, THE AVERAGE
LENGTH OF TIME A USER IS IN THE QUEUE AND THE
COMPUTATIONAL EFFICIENCY PLUS OTHER CHARACTERISTICS
OF THE SYSTEM ARE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-481 350 9/2
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

AN INTEGRATED DISPLAY AND CONTROL SYSTEM FOR MAN-
MACHINE COMMUNICATION. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
62 132P LAWSON, CURTIS G. ;

UNCLASSIFIED REPORT

AVAILABILITY: MICROFICHE COPIES ONLY.

SUPPLEMENTARY NOTE: MICROFICHE ONLY AFTER ORIGINAL COPIES
EXHAUSTED.

DESCRIPTORS: (•MAN MACHINE SYSTEMS, •DIGITAL COMPUTERS),
CONTROL SYSTEMS, COMPUTER PROGRAMMING, DESIGN, INPUT
OUTPUT DEVICES, RADAR SCANNING, CODING, DISPLAY SYSTEMS,
DATA PROCESSING, HUMAN FACTORS ENGINEERING (U)

COMPUTER ORIENTED SYSTEMS HAVE CREATED THE NEED FOR
A CLOSER INTERACTION BETWEEN MEN AND COMPUTERS.
THIS THESIS IS AN EVALUATION OF, AND THE RESULTING
SYSTEM DESIGN OF ONE SUCH SYSTEM. THE MAIN PORTION
OF THE DESIGN IS THAT OF THE OPERATOR'S DISPLAY AND
CONTROL CONSOLE FOR THIS SYSTEM. INCLUDED AS A
PORTION OF THE DESIGN PROBLEM IS A COMPUTER PROGRAM
FOR THE MECHANIZATION OF WIRING DATA FOR CONSTRUCTING
THE DIGITAL EQUIPMENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-486 382 5/5
NEW YORK UNIV N Y DEPT OF INDUSTRIAL ENGINEERING AND
OPERATIONS RESEARCH

FACTORS AFFECTING INFORMATION STORAGE AND RETRIEVAL
IN MAN. (U)

DESCRIPTIVE NOTE: FINAL REPT. SEP 63-JUN 66,
JUN 66 19P MAYZNER, MARK S. ;
CONTRACT: NONR-285(56)
PROJ: NR-196-027

UNCLASSIFIED REPORT

DESCRIPTORS: (•DATA STORAGE SYSTEMS, HUMAN FACTORS
ENGINEERING), (•INFORMATION RETRIEVAL, HUMAN FACTORS
ENGINEERING), HUMANS, DECISION MAKING, COMMAND AND
CONTROL SYSTEMS, DATA PROCESSING, OPERATORS(PERSONNEL),
DESIGN, DISPLAY SYSTEMS, CODING, RECALL,
PERFORMANCE(HUMAN), MATHEMATICAL MODELS,
RETENTION(PSYCHOLOGY), INPUT OUTPUT DEVICES (U)

THIS FINAL REPORT DISCUSSES IN SOME DETAIL THE
MAJOR RESULTS OF SOME 14 STUDIES THAT EXAMINED THE
EFFECTS OF FOUR PARAMETERS NAMELY, (1) CODING
OF INFORMATION, (2) ORGANIZATION OF
INFORMATION, (3) AMOUNT OF INFORMATION, AND
(4) DISPLAY TIME, ON INFORMATION STORAGE AND
RETRIEVAL CAPACITY IN MAN. FIVE STUDIES DEALT
SPECIFICALLY WITH CODING, THREE STUDIES DEALT
SPECIFICALLY WITH ORGANIZATION, TWO STUDIES DEALT
SPECIFICALLY WITH AMOUNT, AND FOUR STUDIES DEALT
SPECIFICALLY WITH DISPLAY TIME. THE RESULTS OF ALL
14 STUDIES WERE RELATED TO A VARIETY OF DISPLAY
DESIGN PROBLEMS IN MILITARY 'COMMAND AND CONTROL'
SYSTEMS AND A NUMBER OF SPECIFIC DISPLAY DESIGN
RECOMMENDATIONS ARE OFFERED BASED ON THE RESEARCH
FINDINGS. (U)

UNCLASSIFIED

JDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-486 869 17/201 17/7 5/10
ITT COMMUNICATION SYSTEMS INC PARAMUS N J

CHANNEL AND TRAFFIC STATUS COLLECTION AND DISPLAY.
VOLUME II. STUDY OF HUMAN FACTORS IN SYSTEM CONTROL
OF AIR COMMUNICATIONS TRAFFIC. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
JUN 60 145P PINE, H. H. 1
CONTRACT: AF 30(635)-12857
TASK: C1122-00-00
MONITOR: ESD TR-66-465-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH RADIO
CORP. OF AMERICA, NEW YORK. SURFACE
COMMUNICATIONS SYSTEMS LAB. SEE ALSO VOLUME I,
AD-486 868L.

DESCRIPTORS: (•COMMUNICATIONS CENTRAL, HUMAN FACTORS
ENGINEERING), (•GLOBAL COMMUNICATION SYSTEMS, DATA
PROCESSING), (•ADAPTIVE COMMUNICATIONS, SYSTEMS
ENGINEERING), CONTROL SYSTEMS, DISPLAY SYSTEMS, DESIGN,
MAP PROJECTION, CONTROL PANELS, MAINTENANCE PERSONNEL,
OPERATORS(PERSONNEL), SWITCHING CIRCUITS, JOB ANALYSIS,
TRAINING DEVICES, APPLIED PSYCHOLOGY,
PERCEPTION(PSYCHOLOGY), REASONING, DECISION MAKING,
RADIO RELAY SYSTEMS (U)
IDENTIFIERS: AIRCOM (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-600 653

NAVAL AIR DEVELOPMENT CENTER JOHNSVILLE PA AERONAUTICAL
COMPUTER LAB

A PROPOSED METHOD OF ERROR SCORING CONTINUOUS TASKS
IN PSYCHOLOGICAL AND PHYSIOLOGICAL EXPERIMENTS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

APR 64 ISP FUTTERWEIT, A. ;
REPT. NO. NADC-AC-6405

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PERFORMANCE (HUMAN), ERRORS),
(*PSYCHOLOGICAL TESTS, ERRORS), (*ERRORS, PSYCHOLOGICAL
TESTS), PSYCHOPHYSIOLOGY, BIONICS, HUMAN FACTORS
ENGINEERING, PROBABILITY, MEASURE THEORY, DATA
PROCESSING, DIGITAL RECORDING SYSTEMS, PROGRAMMING,
COMPUTERS (U)

A METHOD OF ERROR SCORING IS PROPOSED UTILIZING
ERROR AMPLITUDE PROBABILITY DENSITY FUNCTIONS. THE
POTENTIAL BENEFITS OF THIS METHOD ARE DISCUSSED IN
THE INTRODUCTION. THE TECHNIQUE FOR MECHANIZING
THE PROPOSED METHOD IS PRESENTED IN DETAIL FROM DATA
ACQUISITION TO FINAL OUTPUT AND PRESENTATION OF
PROCESSED DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-601 834

BELL HELICOPTER CO FORT WORTH TEX

ALTIMETER DISPLAY STUDY. PART I. SUMMARY AND REVIEW
OF DATA REQUIREMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT., PT. 1, MAY 60-JAN 63,
MAY 64 36P MATHENY, W. G. ;

CONTRACT: AF33 616 8236

PROJ: 6190

TASK: 619008

MONITOR: ASD TDR63 621 P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*ALTIMETERS, DISPLAY SYSTEMS), (*FLIGHT
CONTROL SYSTEMS, SPECIFICATIONS), (*HUMAN FACTORS
ENGINEERING, DISPLAY SYSTEMS), (*DATA PROCESSING,
CONTROL SYSTEMS), CONTROL PANELS, DESIGN, OPERATIONS
RESEARCH, OPTIMIZATION, AVIATION PERSONNEL, OPERATORS
(PERSONNEL), TRAINING, REVIEWS (U)

THE REPORT PRESENTS A BRIEF OVERVIEW OF A NUMBER OF
REPORTS DEALING WITH THE SUBJECT OF FLIGHT CONTROL
INFORMATION REQUIREMENTS. THE DISTINCTION IS MADE
BETWEEN SYSTEM DATA REQUIREMENTS (AS THE TOTALITY
OF DATA TO BE PROCESSED BY THE SYSTEM) AND
INFORMATION REQUIREMENTS (AS THE TOTALITY OF DATA
TO BE PROCESSED BY THE HUMAN OPERATOR). (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-602 042

BIO-DYNAMICS INC CAMBRIDGE MASS

DESIGN AND USE OF INFORMATION SYSTEMS FOR AUTOMATED
ON-THE-JOB TRAINING. II. DESIGN OF SELF-
INSTRUCTIONAL FEATURES, (U)

JAN 64 34P SHERIDAN, THOMAS B. ; DUGGAR,
BENJAMIN C. ; MAYER, SYLVIA R. ;
CONTRACT: AF19 628 455
PROJ: 7682
TASK: 768204
MONITOR: ESD TDR64 234

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMMAND AND CONTROL SYSTEMS, TRAINING
DEVICES), (*TRAINING DEVICES, TEACHING MACHINES),
BEHAVIOR, HUMAN FACTORS ENGINEERING, CODING, PROGRAMMING
(COMPUTERS), DECISION MAKING, TRAINING, LEARNING,
EDUCATION, COMPUTERS, LANGUAGE, AUTOMATION, MODELS
(SIMULATIONS), DESIGN (U)
IDENTIFIERS: SAGE (U)

THE REPORT IS CONCERNED WITH HUMAN ENGINEERING
FACTORS IN THE DESIGN OF INFORMATION SYSTEMS. IN
PARTICULAR IT IS ADDRESSED TO THE DESIGN OF SELF-
INSTRUCTIONAL FEATURES FOR THESE SYSTEMS. IT
DESCRIBES THEORIES, METHODOLOGY, AND DESIGN
PRINCIPLES FOR IMPLEMENTATION OF SELF-INSTRUCTIONAL
FEATURES. THE DESIGN PRINCIPLES WERE INDUCED FROM
THE EXPLORATORY RESEARCH ON LABORATORY MODELS OF
INFORMATION SYSTEMS WHICH IS REPORTED IN VOLUME I
OF THIS SERIES (AD-602 041), FROM STUDIES ON
CURRENT INFORMATION SYSTEMS, AND FROM A LITERATURE
REVIEW. THE OPERATIONAL CONCEPTS UNDERLYING THE
STUDY ARE STATED, AND AN EQUIPMENT DESIGN PHILOSOPHY
IS PROPOSED TO COMPLEMENT THIS OPERATIONAL CONCEPT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-602 617

ELECTRONIC SYSTEMS DIV L G HANSCOM FIELD MASS

AN AUTOMATED FACILITY FOR FORCED-CHOICE SIGNAL
DETECTION EXPERIMENTATION,

(U)

APR 64 32P WATKINS, WILLIAM H. ; NICKERSON,
RAYMOND S. ; SCHJELDERUP, JOHN R. ;
PROJ: 7682
MONITOR: ESD , TDR64 383

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*SIGNAL GENERATORS, DESIGN), (*VISUAL
SIGNALS, VISUAL PERCEPTION), (*AUDITORY SIGNALS,
AUDITORY PERCEPTION), PERCEPTION, DISPLAY SYSTEMS, DATA
PROCESSING, INPUT OUTPUT DEVICES, DATA PROCESSING,
COMPUTERS, TAPES, CONTROL SYSTEMS, ANECHOIC CHAMBERS,
NOISE, HUMAN FACTORS ENGINEERING (U)

THE FACILITY DESCRIBED ALLOWS PRESENTATION OF
VISUAL, AUDITORY, OR BISENSORY SIGNALS FOR THE STUDY
OF FORCED-CHOICE SIGNAL DETECTION. MEANS ARE
PROVIDED FOR INFORMING THE OBSERVER, PRIOR TO EACH
TRIAL, OF THE SIGNAL MODE HE SHOULD EXPECT ON THAT
TRIAL. CONSIDERABLE FLEXIBILITY IS PROVIDED FOR
THE SCHEDULING OF INTERMITTENT NOISE (AUD. AND/OR
VIS.) WITHIN AN OBSERVATION INTERVAL. THE
FACILITY INCLUDES AN OBSERVER'S STATION WITHIN AN
ANECHOIC CHAMBER AND A CONTROL UNIT IN A SEPARATE
ROOM. DATA COLLECTION SESSIONS ARE FULLY
AUTOMATED. THE CONTROL SYSTEM READS A PAPER TAPE
INPUT AND PRODUCES A PAPER TAPE OUTPUT. INPUT
(STIMULUS SCHEDULING) TAPES ARE GENERATED, AND
OUTPUT (DATA) TAPES ARE PROCESSED, BY A PDP-1
COMPUTER. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-604 578

RAND CORP SANTA MONICA CALIF

HUMAN FACTORS IN SYSTEMS RESEARCH,

(U)

JUN 61 33P HAYTHORN, W. W. ;
REPT. NO. P-2337

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, MACHINES),
(*AUTOMATION, HUMAN FACTORS ENGINEERING), SIMULATION,
PSYCHOLOGY, DECISION MAKING, PERSONNEL, WEAPON SYSTEMS,
LOGISTICS, TRAINING (U)

A NUMBER OF SYSTEMS RESEARCH EFFORTS IN WHICH HUMAN
FACTORS CONSIDERATIONS PLAY KEY ROLES ARE DESCRIBED
WITH A VIEW TO ILLUSTRATING TECHNIQUES FOR EXAMINING
HUMAN FACTORS PROBLEMS IN A BROAD SYSTEMS CONTEXT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-604 866

INSTITUTE OF ENVIRONMENTAL PSYCHOPHYSIOLOGY UNIV OF
MASSACHUSETTS AMHERST

PERCEPTION AND SHORT TERM MEMORY UNDER WORK LOAD
STRESS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,

JUN 64 52P SEIBEL, ROBERT ; CHRIST,

RICHARD E. ; TEICHNER, WARREN H. ;

CONTRACT: N61339 1303

MONITOR: NAVTRADEVCE 1303-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMPUTER OPERATORS, STRESS (PSYCHOLOGY)),
(*PERCEPTION (PSYCHOLOGY), STRESS (PSYCHOLOGY)),
(*MEMORY (PSYCHOLOGY), STRESS (PSYCHOLOGY)), (*STRESS
(PSYCHOLOGY), PERFORMANCE (HUMAN)), COMMUNICATION
SYSTEMS, ADJUSTMENT (PSYCHOLOGY), INPUT OUTPUT DEVICES,
DATA STORAGE SYSTEMS, SYSTEMS ENGINEERING, TRAINING,
VISUAL PERCEPTION, RECALL, HUMAN FACTORS ENGINEERING,
DATA PROCESSING, ANALYSIS OF VARIANCE (U)

THE PRIMARY PURPOSE OF THESE STUDIES WAS TO EXPLORE
THE QUESTION OF WHETHER A PERFORMANCE WHICH IS
CRITICALLY DEPENDENT UPON SHORT-TERM MEMORY BREAKS
DOWN WITH INPUT RATE INCREASES WHEN PERFORMANCE IS
MEASURED IN ABSOLUTE TERMS. SINCE, FOR ANY FIXED
INPUT TIME, INCREASES IN QUANTITY OF INFORMATION
REPRESENT INCREASES IN THE INPUT RATE, A BREAKDOWN,
IF DEMONSTRATED, CAN BE THOUGHT OF AS THE RESULT OF
EXCEEDING THE MEMORY STORAGE RATE. THUS, IT COULD
BE ASKED, GIVEN SUCH A BREAKDOWN, WHETHER THE
ABSOLUTE PERFORMANCE LEVEL MIGHT NOT BE INCREASED BY
REDUCING THE INFORMATIONAL INPUT LOAD. IN SIMPLER
TERMS, WILL S REPORT MORE CORRECT ITEMS WHEN THERE
IS LESS TO BE RECALLED THAN WHEN THERE IS TOO MUCH TO
BE RECALLED. THE STUDIES WERE SET UP WITH THESE
QUESTIONS IN MIND. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-607 520

DUNLAP AND ASSOCIATES INC DARIEN CONN

DEVELOPMENT OF A MAN-COMPUTER SYSTEM FOR SOLVING A
TARGETING PROBLEM,

(U)

64 22P GAGLIARDI, UGO O. ;

CONTRACT: NONR3602 00

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PAPER PRESENTED AT THE WESTERN
STATES NAVY RESEARCH AND DEVELOPMENT CLINIC,
MONTANA STATE COLLEGE, BOZEMAN, 22-24 JUL 64.

DESCRIPTORS: (*SYSTEMS ENGINEERING, WARFARE), (*LINEAR
PROGRAMMING, UNDERSEA WARFARE), (*SUBMARINES,
SCHEDULING), TARGETS, WEAPON SYSTEMS, OPTIMIZATION,
SEARCH THEORY, GUIDED MISSILE DEFENSE SYSTEMS,
OPERATIONS RESEARCH, HUMAN FACTORS ENGINEERING,
DEPLOYMENT, AUTOMATION

(U)

IDENTIFIERS: TARGETING

(M)

THIS STUDY WAS CONDUCTED TO DEVELOP A METHOD FOR
THE DESIGN OF COMPUTERIZED PROBLEM-SOLVING AIDS.
THE METHOD RELIES ON THE OBSERVATION OF PROBLEM-
SOLVING BEHAVIOR AND UTILIZES THE EVIDENCES OF
HEURISTIC PROCEDURES DISPLAYED BY THE SUBJECT AS
INDICATORS OF PROCESSING OVERLOADS. THIS
INFORMATION IS, IN TURN, USED TO FORMULATE PROBLEM-
SOLVING AIDS WHOSE EFFECTIVENESS IS VERIFIED
EXPERIMENTALLY. THE PROBLEMS USED WERE SELECTED
BECAUSE THEY HAVE A FORMAL STRUCTURE WHICH ADMITS
MANY INTERPRETATIONS--FROM THE DESIGN OF MINIMAL
SWITCHING CIRCUITS TO THE DISPOSITION OF WEAPON
SYSTEMS. THE SUBJECT'S TASK WAS TO ALLOCATE
HYPOTHETICAL MISSILE-FIRING SUBMARINES SO THAT A
SPECIFIED NUMBER OF TARGETS WAS COVERED BY THE FEWEST
POSSIBLE SHIPS. THIS TASK COULD BE FORMULATED AS A
LINEAR INTEGER PROGRAMMING PROBLEM WHICH WAS SOLVABLE
BY GOMORY'S ALGORITHM. HOWEVER, COMPLETE
AUTOMATION OF THE TASK, USING THIS ALGORITHM, WAS
UNDESIRABLE BECAUSE THE PROCEDURE WAS EXCESSIVELY
TIME-CONSUMING WHEN MORE THAN A FEW SOLUTIONS WERE
REQUIRED. EXPERIMENTS INDICATED THAT THE SUBJECT'S
PROCESSING LIMITATIONS RESULTED IN A SLOW AND BIASED
SEARCH FOR ELEMENTS FROM WHICH TO ASSEMBLE SOLUTIONS.
THE AIDED SYSTEM DELEGATED THE SUBTASK OF FINDING
KEY ELEMENTS TO AN AUTOMATED PROCESS AND LET THE
PERSON ASSEMBLE THESE ELEMENTS INTO DEPLOYMENTS.
THE EFFECTIVENESS OF THIS ARRANGEMENT WAS SHOWN BY
THE FACT THAT AIDED SUBJECTS FOUND MORE SOLUTIONS,

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-607 735

IIT RESEARCH INST CHICAGO ILL

ERROR CONTROL METHODS FOR AN AUTOMATIC CHECKOUT
SYSTEM.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 JAN-14 DEC 63,
MAR 64 159P LEWIS, THEODORE S. ; HUEBNER,

WALTER J. ;

CONTRACT: AF33 657 10271

PROJ: 7184 8119

TASK: 718404

MONITOR: AMRL , TDR64 17

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*CHECKOUT EQUIPMENT, HUMAN FACTORS
ENGINEERING), (*HUMAN FACTORS ENGINEERING, ERRORS),
(*CHECKOUT PROCEDURES, CONTROL SYSTEMS), AUTOMATIC,
COMPUTERS, PROGRAMMING (COMPUTERS), SIMULATION,
GRAPHICS, TEST METHODS

(U)

THE DEVELOPMENT OF ERROR CONTROL TECHNIQUES FOR THE
MAN-COMPUTER INTERFACE OF AN AUTOMATIC CHECKOUT SYSTEM
IS PRESENTED. TO MINIMIZE HUMAN ERROR IN MAN-
COMPUTER COMMUNICATION IN THE AUTOMATIC CHECKOUT
COMPLEX PRECEDENCE AND CONNECTION MATRIX TECHNIQUES
FOR USE WITH TOTAL AND PARTIAL SIMULATION METHODS
WERE DEVELOPED TO DETECT ERRORS IN OPERATIONAL
AUTOMATIC CHECKOUT COMPUTER PROGRAMS. PRECEDENCE
AND CONNECTION MATRIX TECHNIQUES FOR USE WITH TOTAL
SIMULATION METHODS WERE INCORPORATED INTO A
SIMULATION COMPUTER PROGRAM WHICH COMPRISED A TOTAL
SIMULATION OF THE COMPUTER WHICH CONTROLS AN
OPERATIONAL AUTOMATIC CHECKOUT SYSTEM. THE
MODIFIED SIMULATION WAS THEN USED TO PROCESS SEVERAL
COMPUTER RUNS OF AN OPERATIONAL AUTOMATIC CHECKOUT
COMPUTER PROGRAM. THE BASIC CONCLUSIONS WERE THAT
PRECEDENCE AND CONNECTION MATRIX TECHNIQUES USED WITH
TOTAL AND PARTIAL SIMULATION METHODS CAN BE USEFUL IN
DETECTING ERRORS IN OPERATIONAL COMPUTER-CONTROLLED
AUTOMATIC CHECKOUT SYSTEMS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-609 749

MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS
LAB

HUMAN USE OF SHORT TERM MEMORY IN PROCESSING
INFORMATION ON A CONSOLE, (U)

SEP 64 49P ZEIGLER, BERNARD P. ; SHERIDAN,
THOMAS B. ;
REPT. NO. DSR-9960-1
CONTRACT: AF19 628 3317
PROJ: 7682
TASK: 768204
MONITOR: ESD , TDR64 620

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (COMPUTER PERSONNEL, MEMORY (PSYCHOLOGY)),
(MEMORY DEVICES, HUMAN FACTORS ENGINEERING), DECISION
MAKING, COMPUTERS, INFORMATION RETRIEVAL, DATA
PROCESSING, DATA STORAGE SYSTEMS, COMMUNICATION THEORY,
LEARNING (U)

THE REPORT ASSUMES THAT AN OPERATOR'S CONSOLE
CONSTITUTES A THIRD FORM OF MEMORY IN ADDITION TO
THAT INTEGRAL TO THE HUMAN AND THAT INTEGRAL TO THE
MACHINE WHICH IS NOT DIRECTLY ACCESSIBLE TO THE
HUMAN. QUESTIONS ARE RAISED CONCERNING THE
CHARACTERISTIC MODES OF HUMAN STORAGE AND RETRIEVAL
OF INFORMATION FROM INTERNAL MEMORY WHEN SUCH
EXTERNAL MEMORY IS ACCESSIBLE. THE REPORT ALSO
INTRODUCES THE CONCEPT OF ASSOCIATIVE MEMORY NETS
FORMED BY CUERELATED IMAGES OF EXTERNAL EVENTS. A
LIST PROCESSING EXPERIMENT IS DESCRIBED. STORAGE
STRUCTURES CHARACTERIZING INTERNAL HUMAN MEMORY AND
EXTERNAL CONSOLE MEMORY IN THIS TASK ARE POSTULATED.
A RETRIEVAL MODEL IMPLIED BY THESE STURCTURES IS
CONSTRUCTED TO ACCOUNT FOR THE EFFECTS OF COMPUTATION
AND LEARNING UPON THE FEATURES OF THE EXPERIMENTALLY
OBTAINED CURVES. INSUFFICIENT RETRIEVAL OF
REQUIRED INFORMATION FROM INTERNAL MEMORY IS ASSUMED
TO NECESSITATE EXTERNAL MEMORY SEARCH. THE EFFECT
OF COMPUTATION IS TO INCREASE THE PROBABILITY OF
INSUFFICIENT RETRIEVAL AND HENCE THE FREQUENCY OF
EXTERNAL SEARCH. LEARNING DECREASES THIS
PROBABILITY. THE EFFECTS OF INDUCING ALTERNATE
FORMS OF INTERNAL STORAGE ARE STUDIED AND FOUND
GENERALLY TO RESULT IN INCREASED STORAGE AND
RETRIEVAL TIMES. IMPLICATIONS FOR CONSOLE DESIGN
ARE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-610 249

DOUGLAS AIRCRAFT CO INC LONG BEACH CALIF

ARMY-NAVY INSTRUMENTATION PROGRAM HISTORICAL
REPORT.

(U)

JUN 62 80P
REPT. NO. LB-40641

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*INSTRUMENTATION, SYSTEMS ENGINEERING),
(*SYSTEMS ENGINEERING, MILITARY RESEARCH), DISPLAY
SYSTEMS, RESEARCH MANAGEMENT, FEASIBILITY STUDIES,
COMPUTERS, HUMAN FACTORS ENGINEERING, MATERIALS,
CIRCUITS, SIMULATION, FLIGHT INSTRUMENTS, DATA,
MINIATURE ELECTRONIC EQUIPMENT, INSTRUMENT PANELS (U)

LACK OF ABILITY TO IMPLEMENT INSTRUMENTATION AND
DISPLAY SYSTEMS WHICH WOULD BETTER FIT MAN'S
REQUIREMENTS CAUSED ANIP TO CONDUCT RESEARCH IN
MANY AREAS FOR BASIC INFORMATION AND FOR APPLICATION
OF INFORMATION ALREADY AT HAND. THESE AREAS
INCLUDED COMPUTER THEORY AND IMPLEMENTATION,
MATERIALS, DISPLAY DEVICES, SENSORS, FEASIBILITY,
HUMAN FACTORS AND SYSTEMS ANALYSIS. FEASIBILITY
STUDIES INCLUDED ONE FIXED-WIND FLYABLE SYSTEM AND
TWO ROTARY-WING SYSTEMS. LABORATORY FACILITIES ARE
USED FOR HUMAN FACTORS AND SYSTEM RESEARCH,
EVALUATION AND DEMONSTRATION. RESULTS OF THE
PROGRAM ARE BREAKTHROUGHS IN HUMAN FACTORS
REQUIREMENTS FOR DISPLAY CONTENT, DISPLAY DESIGN AND
IMPLEMENTATION, MATERIALS AND THEIR RELATION TO
ELECTROMAGNETIC PHENOMENA, DISPLAY DEVICES, COMPUTER
THEORY AND CONSTRUCTION ADVANCES, AND INERTIAL SENSOR
CONCEPTUAL EVALUATION WHICH HAS PRODUCED A NEW
CONCEPT HAVING UNUSUALLY HIGH PRACTICAL APPLICATION
POTENTIAL. ALL OTHER RESULTS ARE OVERSHADOWED BY
PROOF THAT THE MAN-MACHINE SYSTEM AND REQUIREMENTS
APPROACH COUPLED WITH RESEARCH ALLOCATED TO PROBLEM
AREAS ON A PRIORITY BASIS CAN YIELD SYSTEMS OF
SUPERIOR PERFORMANCE IN MINIMUM COST AND TIME. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-610 546

SPERRY RAND CORP LONG ISLAND CITY N Y FORD INSTRUMENT
DIV

FEASIBILITY STUDY FOR A POSITION LOCATOR.

(U)

DESCRIPTIVE NOTE: FINAL REPT.

DEC 64 33P

CONTRACT: DA18 001AMC286X

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•POSITION FINDING, MILITARY OPERATIONS),
(•NAVIGATIONAL AIDS, MILITARY OPERATIONS), WARFARE, ARMY
OPERATIONS, MILITARY PERSONNEL, DISTANCE MEASURING
EQUIPMENT, ACCELEROMETERS, COMPUTERS, HUMAN FACTORS
ENGINEERING, ENVIRONMENTAL TESTS, THEORY, FEASIBILITY
STUDIES (U)

THIS REPORT DESCRIBES THE RESULTS OF A PROGRAM TO
DESIGN, FABRICATE AND TEST A BREADBOARD MODEL OF A
SELF CONTAINED MAN POSITION LOCATOR IN ORDER TO
DEMONSTRATE THE FEASIBILITY OF THE CONCEPT AND TO
SHOW THAT ACTUAL HARDWARE WOULD BE CAPABLE OF
PERFORMING IN A REASONABLE AND USEFUL MANNER AND WITH
REQUISITE ACCURACY. THE MAN POSITION LOCATOR
UTILIZES A PEDOMETER STEP SENSOR, AN ACCELEROMETER
FOR MEASURING A STEP PARAMETER WHICH WOULD PROVIDE
FOR VARIATIONS IN PACE LENGTH, A COMPUTER TO RECEIVE
THESE SIGNALS AND CONVERT THEM INTO MAP COORDINATES
AND TWO COUNTER TYPE INDICATORS, ONE FOR EACH MAP
ORDINATE, TO INDICATE POSITION. IT WAS
DEMONSTRATED UNDER MANY DIFFERENT TYPES OF TERRAIN
AND GROUND SURFACE THAT A MAN'S POSITION COULD BE
MEASURED TO ACCURACIES OF 2% AND BETTER. IT WAS
ALSO RECOMMENDED THAT THE DEVICE BE DEVELOPED INTO A
COMBAT USEFUL PACKAGE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-612 726

BUNKER-RAMO CORP CANOGA PARK CALIF

HUMAN ENGINEERING: PILOT FACTORS PROGRAM. (U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT. FOR 1 OCT 64-31
JAN 65,

FEB 65 18P MCTEE, A. C. ; SWARTZ, W. F. ;
CONTRACT: AF33 615 2214

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE. RESEARCH A CONTINUATION OF CONTRACT
AF33 616 7752. AVAILABLE COPY WILL NOT PERMIT FULLY
LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF
REQUESTED BY USERS OF DDC. COPY AVAILABLE FOR PUBLIC SALE.

DESCRIPTORS: (•LANDING, ALL WEATHER AVIATION),
(•ALLWEATHER AVIATION, RESEARCH MANAGEMENT), (•HUMAN
FACTORS ENGINEERING, FLIGHT CONTROL SYSTEMS),
(•INSTRUMENT FLIGHT, ALL WEATHER AVIATION), PILOTS,
AIRCRAFT EQUIPMENT, ROLL, PITCH (MOTION), OSCILLOGRAPHS,
DATA PROCESSING (U)

THE WORK REPORTED IN THIS STUDY REPRESENTS A
PORTION OF THE CONTINUING EFFORT TO DEFINE THE PILOT
FACTORS ESSENTIAL TO SUCCESSFUL ALL-WEATHER LANDING.
THE PROGRAM IS HERE DESCRIBED IN THREE GENERAL
ACTIVITY AREAS, WHICH ARE CALLED RESPECTIVELY THE
T-39, T-29, AND CONSULTING AREAS. THESE AREAS
ARE CHARACTERIZED BY A COMMON PLAN OF APPROACH:
TECHNICAL DIRECTION AND FURNISHING OF PROJECT
EQUIPMENT BY THE LEAR-SIEGLER ENGINEERING SUPPORT
GROUP, DEVELOPMENT OF INSTRUMENT FLYING PROCEDURES
AND INFLIGHT CONDUCT OF STUDIES BY THE INSTRUMENT
EVALUATION SECTION, AND DEVELOPMENT OF
MEASUREMENT TECHNIQUES, DATA COLLECTION, REDUCTION,
AND ANALYSIS BY THE GBUNKER-RAMO SUPPORT GROUP.
THIS REPORT MAKES NO EFFORT AT THE DISTINCTION OF
THE EFFORTS OF THE INDIVIDUAL ELEMENTS, EXCEPT THAT
IT IS PERHAPS MORE CONVERSANT WITH THE ACTIVITIES OF
THE HUMAN ENGINEERING SUPPORT GROUP. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-612 898

TRW COMPUTERS CO CANOGA PARK CALIF

AIR TRAFFIC CONTROL STUDIES. TERMINAL AREA
SEQUENCING AND CONTROL.

(U)

DESCRIPTIVE NOTE: REPT. NO. 10 (FINAL) 1 JAN 60-28
FEB 61,

FEB 61 253P JACKSON, A. S. ; OTTOSON, H. I. ;
PARDEE, R. S. ; NALL, L. E. ; HOLLAND, F. C. ;
CONTRACT: FAA BRD112

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPT. ON PROJECT TASC.

DESCRIPTORS: (*AIR TRAFFIC CONTROL TERMINAL AREAS,
SIMULATION), REAL TIME, FLIGHT SIMULATORS, COMPUTERS,
DISPLAY SYSTEMS, APPROACH, LANDING, CONTROL SEQUENCES,
HUMAN FACTORS ENGINEERING, SYSTEMS ENGINEERING, ALL
WEATHER AVIATION, AVIATION SAFETY

(U)

THE MAJOR AREAS OF COVERAGE ARE: (1) PHILOSOPHY
AND AIMS OF REAL-TIME SIMULATION IN THE TERMINAL
AREA, (2) EQUIPMENT AVAILABLE FOR REAL-TIME
SIMULATION, (3) BRIEF DESCRIPTION OF THE SYSTEMS
THAT HAVE BEEN SIMULATED, AND (4) RESULTS
OBTAINED FROM REAL-TIME SIMULATION AND THEORETICAL
STUDIES.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-613 105

AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD
MASS

RESEARCH IN COMPUTER SCIENCES,

(U)

FEB 65 27P ZSCHIRNT, HANS H. ;
REPT. NO. SR-21 , AFCRL-65-101
PROJ: 5632

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AIR UNIVERSITY REVIEW
(U.S.) V16 N1 P47-66 NOV-DEC 1964 (COPIES NOT
AVAILABLE TO DDC OR CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (*COMPUTERS, DATA PROCESSING), (*DATA
PROCESSING, COMPUTERS), (*INFORMATION RETRIEVAL,
THEORY), (*ARTIFICIAL INTELLIGENCE, DIGITAL COMPUTERS),
MILITARY REQUIREMENTS, HUMAN FACTORS ENGINEERING,
PATTERN RECOGNITION, PROGRAMMING (COMPUTERS),
PROGRAMMING LANGUAGES, CYBERNETICS, DISPLAY SYSTEMS (U)

CONTENTS: SOME PROPERTIES OF DIGITAL COMPUTERS,
SOME ASPECTS OF ARTIFICIAL INTELLIGENCE, PROBLEM
SOLVING AND GAMES, PATTERN RECOGNITION, MAN/MACHINE
INTERFACE, NEW CONCEPTS-NEW MACHINES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-615 758

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS LAB OF
AVIATION PSYCHOLOGY

THE INFLUENCE OF EXPERIENCE AND INPUT INFORMATION
UPON POSTERIOR PROBABILITY ESTIMATION IN A SIMULATED
THREAT-DIAGNOSIS SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 1 OCT 63-1 JUN 64,
APR 65 79P SCHUM, DAVID A.; GOLDSTEIN,
IRWIN L.; SOUTHARD, JACK F.;
CONTRACT: AF33 657 10763
PROJ: 7184
TASK: 718403
MONITOR: AMRL, TR-65-25

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*THREAT EVALUATION, DECISION MAKING),
(*DECISION MAKING, SIMULATION), (*PERFORMANCE (HUMAN),
THREAT EVALUATION), (*COMPUTERS, THREAT EVALUATION),
MATHEMATICAL PREDICTION, HUMAN FACTORS ENGINEERING,
PSYCHOLOGY, PROBABILITY (U)
IDENTIFIERS: BAYES THEOREM (U)

TWO EXPERIMENTS ARE DESCRIBED IN WHICH POSTERIOR
PROBABILITY ESTIMATES MADE BY HUMANS ARE COMPARED
WITH SIMILAR ESTIMATES MADE BY A COMPUTER USING A
MODIFICATION OF BAYES' THEOREM INCORPORATING HUMAN
ESTIMATES OF $P(D/H)$. THE TASK WAS TO ESTIMATE, ON
THE BASIS OF INTELLIGENCE DATA FROM A SIMULATED
THREAT-EVALUATION SITUATION, THE LIKELIHOOD OF
VARIOUS ALTERNATIVE HYPOTHESES THAT COULD ACCOUNT FOR
THE OBSERVED DATA. THE PURPOSE OF THE FIRST
EXPERIMENT WAS TO DETERMINE THE EFFECT OF INCREASED
EXPERIENCE UPON THE HUMAN'S ABILITY TO ESTIMATE
POSTERIOR PROBABILITIES. THE PURPOSE OF THE SECOND
EXPERIMENT WAS TO COMPARE HUMAN AND AUTOMATED
POSTERIOR PROBABILITY ESTIMATES UNDER SEVERAL LEVELS
OF INPUT DATA FIDELITY. IT WAS PREDICTED THAT,
UNDER LOW FIDELITY CONDITIONS, HUMAN POSTERIOR
PROBABILITY ESTIMATES WOULD BECOME INCREASINGLY
INFERIOR TO AUTOMATED SOLUTIONS. THIS HYPOTHESIS
WAS ONLY PARTIALLY CONFIRMED. IN BOTH EXPERIMENTS,
BUT PARTICULARLY IN THE SECOND, THE HUMANS PROVIDED
HIGHER POSTERIOR PROBABILITY ESTIMATES THAN THE
CERTAINTY IN THE DATA JUSTIFIED. WITH RESPECT TO
THE DESIGN OF DIAGNOSTIC SYSTEMS, THE PRESENT
RESEARCH TENDS TO CONFIRM THE FEASIBILITY OF
AUTOMATED BAYESIAN HYPOTHESIS-SELECTION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-616 544

BIO-DYNAMICS INC CAMBRIDGE MASS

DESIGN AND USE OF INFORMATION SYSTEMS FOR AUTOMATED
ON-THE-JOB TRAINING. VOLUME III. EXPERIMENTAL USE OF
THREE INSTRUCTIONAL CONCEPTS, (U)

MAR 65 84P CHERIDAN, THOMAS B. ;
CONTRACT: AF19 628 455
PROJ: 7682
TASK: 768204
MONITOR: ES , TDR-64-234 V3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-602 041, AD-602 042.

DESCRIPTORS: (•TRAINING DEVICES, COMMAND AND CONTROL
SYSTEMS), (•COMMAND AND CONTROL SYSTEMS, TRAINING
DEVICES), DESIGN, AUTOMATION, TEACHING MACHINES,
COMPUTERS, BEHAVIOR, GAME THEORY, PERFORMANCE(HUMAN),
PERFORMANCE(HUMAN), DISPLAY SYSTEMS, CONTROL PANELS,
ERRORS, DECISION MAKING, HUMAN FACTORS ENGINEERING, AIR
FORCE PERSONNEL (U)
IDENTIFIERS: JOB TRAINING, JOBS,
PERFORMANCE(HUMAN) (U)

THE REPORT DESCRIBES THREE EXPERIMENTS IN WHICH
NOVEL TEACHING CONCEPTS WERE DEMONSTRATED. THESE
CONCEPTS HAD BEEN PROPOSED IN PREVIOUS REPORTS BUT
THEIR EFFECTIVENESS REMAINED TO BE VERIFIED
EXPERIMENTALLY. THE RESULTS WERE: (1) A
TEACHING PROGRAM ORDERED ACCORDING TO THE DISCOVERY
PRINCIPLE SIGNIFICANTLY REDUCED ERRORS AND
PERFORMANCE TIME OVER THAT OBSERVED AFTER TRAINING
WITH A CONVENTIONAL TRAINING MANUAL. (2) SLIDES
PROJECTED DIRECTLY ONTO A CONTROL CONSOLE, TOGETHER
WITH A TAPED LECTURE, WERE FOUND TO BE AN EFFECTIVE
METHOD OF PRESENTING AN AUTOMATED TRAINING PROGRAM.
(3) GRAPHICAL LOGICAL FLOW DIAGRAMS WERE FOUND TO
BE EFFICIENT INSTRUCTIONS FOR TEACHING PROCEDURES FOR
PERFORMING A QUERYING-REASONING TASK. IT WAS
CONCLUDED THAT THESE CONCEPTS SHOULD BE EXPLOITED IN
TRAINING PROGRAMS FOR OPERATORS OF AIR FORCE
INFORMATION SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-616 765

BUNKER-RAMO CORP CANOGA PARK CALIF

HUMAN ENGINEERING SUPPORT: PILOT FACTORS
PROGRAM.

(U)

DESCRIPTIVE NOTE: FINAL SUMMARY REPT. FOR 1 MAR-22 MAY
65.

MAY 65 21P

CONTRACT: AF33 615 2214

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONTINUATION OF CONTRACT AF33 616
7752, SEE ALSO AD-612 726.

DESCRIPTORS: (*INSTRUMENT FLIGHT, HUMAN FACTORS
ENGINEERING), (*HUMAN FACTORS ENGINEERING, PILOTS),
(*AIRCRAFT LANDINGS, ALLWEATHER AVIATION), (*FLIGHT
CONTROL SYSTEMS, AIRCRAFT LANDINGS), GUIDANCE, DISPLAY
SYSTEMS, AUTOMATIC, COMPUTER PROGRAMMING, DATA
PROCESSING, LANDING, TRAINING PLANES

(U)

IDENTIFIERS: T-29 AIRCRAFT

(U)

THE REPORT COVERS THE FOUR GENERAL ACTIVITY AREAS.
THESE AREAS ARE CHARACTERIZED BY A COMMON PLAN OF
APPROACH: (1) TECHNICAL DIRECTION AND FURNISHING
OF PROJECT EQUIPMENTS BY THE FLIGHT CONTROL
DIVISION; (2) INSTALLATIONS AND MAINTENANCE OF
PROJECT EQUIPMENT BY THE LEAR-SIEGLER ENGINEERING
SUPPORT GROUP; (3) DEVELOPMENT OF INSTRUMENT
FLYING PROCEDURES AND INFLIGHT CONDUCT OF STUDIES BY
THE INSTRUMENT EVALUATION SECTION; AND (4)
DEVELOPMENT OF MEASUREMENT TECHNIQUES, DATA
COLLECTION, REDUCTION, AND ANALYSIS BY THE BUNKER-
RAMO SUPPORT GROUP. EACH OF THE FOUR AREAS IS
DISCUSSED AS AN ENTITY, WITH THE PROBLEMS AND
PROGRESS OF THE INDIVIDUAL AREA PLACED IN CONTEXT.
THE APPENDICES CONTAIN CHRONOLOGICAL ACCOUNTS OF:
PRESENTATIONS TO MEMBERS OF THE INTERESTED FLYING
COMMUNITY, INCLUDING DEMONSTRATION FLIGHTS IN PI-
FAX AIRCRAFT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-617 288

TEXAS TECHNOLOGICAL COLL LUBBOCK SCHOOL OF
ENGINEERING

OPTIMAL THREE-DIMENSIONAL WORK PLACE FOR THE SEATED
WORKER. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
MAY 65 B1P WYATT, RICHARD H. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, INDUSTRIAL
PLANTS); (*INDUSTRIAL EQUIPMENT, HUMAN FACTORS
ENGINEERING), ANTHROPOMETRY, PERFORMANCE(HUMAN), DESIGN,
JOB ANALYSIS, ENGINEERING, CONTROL PANELS, MOTION,
STATISTICAL ANALYSIS, FACTOR ANALYSIS, ANALYSIS OF
VARIANCE, DATA PROCESSING, GRAPHICS (U)
IDENTIFIERS: INDUSTRIAL ENGINEERING (U)

THE PURPOSE OF THIS STUDY WAS TO INVESTIGATE THE
WORK AREA FOR USE IN THE PERFORMANCE OF SMALL, MANUAL
PRODUCTION OR ASSEMBLY JOBS AND TO DETERMINE THE BEST
SHAPE FOR THIS THREE-DIMENSIONAL SPACE BASED UPON THE
VARIABLE FACTORS THAT AFFECT WORK PERFORMANCE TIMES.
THIS OPTIMAL SHAPE MAY ALSO BE APPLICABLE IN THE
DESIGN OF SYSTEM CONTROL PANELS, WHERE RESPONSES
REQUIRE HAND MOTION TO CONTROLS LOCATED ON A PANEL.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-621 379

COMPUTER CONCEPTS INC SILVER SPRING MD

THE ROLE OF HUMAN FACTORS TASK DATA IN AEROSPACE
SYSTEM DESIGN AND DEVELOPMENT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FOR 15 JUN 64-15 FEB 65.

AUG 65 98P HANNAH, L. DUNCAN ;BOLDOVICI,
JOHN A. ;ALTMAN, JAMES W. ;MANION, RAYMOND C.

CONTRACT: AF33 515 1557

PROJ: 1710

TASK: 171006

MONITOR: AMRL , TR-65-131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUBCONTRACTED TO AMERICAN INST.
FOR RESEARCH, PITTSBURGH, PA.

DESCRIPTORS: (*DATA PROCESSING, HUMAN FACTORS
ENGINEERING), (*HUMAN FACTORS ENGINEERING, WEAPON
SYSTEMS), (*SPACE FLIGHT, SYSTEMS ENGINEERING), (*AIR
FORCE, SYSTEMS ENGINEERING), MANAGEMENT ENGINEERING,
PERSONNEL MANAGEMENT, DECISION MAKING, AUTOMATION,
INFORMATION RETRIEVAL, SUPERVISORS, COMPUTERS, DATA
STORAGE SYSTEMS, PERFORMANCE(HUMAN), GROUND SUPPORT
EQUIPMENT

(U)

ON THE BASIS OF INFORMATION GATHERED FROM
GENERATORS AND USERS OF HUMAN FACTORS TASK DATA BY
BOTH INTERVIEWS AND QUESTIONNAIRES AND BY A REVIEW OF
RELEVANT LITERATURE, HUMAN FACTORS PERSONNEL AND DATA
WERE IDENTIFIED, THE RELATIONS BETWEEN THEM
DESCRIBED, AND RECOMMENDATIONS FOR AN AUTOMATED HUMAN
FACTORS TASK DATA HANDLING SYSTEM PROPOSED. HUMAN
FACTORS PERSONNEL WERE CLOSELY DIVISIBLE INTO FOUR
HIERARCHICALLY ARRANGED GROUPS: PROGRAM LEVEL
MANAGERS, PERSONNEL SUBSYSTEM MANAGERS,
DEPARTMENT HEADS, AND NONMANAGERIAL
PERSONNEL. IN GENERAL, AND FOR THE POPULATIONS
DESCRIBED, MANAGERS OR SUPERVISORS WERE THE PRINCIPAL
USERS AND NONMANAGERIAL PERSONNEL THE PRINCIPAL
GENERATORS OF HUMAN FACTORS DATA. A FRAMEWORK THAT
PERMITS CLASSIFICATION OF BOTH FORMATTED AND
UNFORMATTED DATA WAS PROPOSED AS RESPONSIVE TO THE
GENERALLY FELT NEED BY DATA GENERATORS AND USERS FOR
MORE ORDERLY 'BOOKKEEPING' IN THE HUMAN FACTORS
REALM. DESIRABLE CHARACTERISTICS OF AN AUTOMATED
HUMAN FACTORS TASK DATA HANDLING SYSTEM WERE DERIVED
FROM THE QUESTIONNAIRE RESPONSES.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-623 157

FMC CORP SANTA CLARA CALIF CENTRAL ENGINEERING LABS

ACCURACY OF SOURCE DATA HUMAN ERROR IN HAND
TRANSCRIPTION.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. FOR 1 APR 64-31
MAR 65,

MAY 65 275P MCARTHUR, BRUCE N. ;

REPT. NO. FMC-R-2234

CONTRACT: AF33 615 1276

PROJ: 1523

TASK: 152306

MONITOR: ASD , TR-65-10

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SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY
LEGIBLE REPRODUCTION. REPRODUCTION WILL BE MADE IF
REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC
SALE.

DESCRIPTORS: (*COMPUTER PROGRAMMING, ERRORS), (*ERRORS,
HUMANS), (*HUMAN FACTORS ENGINEERING, COMPUTER
PROGRAMMING), DATA PROCESSING, CHARACTER RECOGNITION,
NUMBERS, ITERATIONS, PROGRAMMING LANGUAGES, FACTOR
ANALYSIS, PERFORMANCE(HUMAN), STATISTICAL ANALYSIS,
GRAPHICS, TABLES(DATA)

(U)

AN EXPERIMENTAL HUMAN FACTORS STUDY OF HUMAN ERROR
IN HAND TRANSCRIPTION WAS PERFORMED. THE
OBJECTIVES WERE TO DETERMINE UNDER LABORATORY
CONDITIONS, THE EFFECTS ON TRANSCRIPTION ACCURACY OF
CERTAIN HUMAN FACTORS, SOURCE, DATA FACTORS, TASK
FACTORS AND ENVIRONMENTAL CONDITIONS. THE FACTORS
WERE SUBJECT AGE, SEX AND OCCUPATION, ARRANGEMENT OF
CODES, AND CODE CONTENT AND STRUCTURE, TRANSCRIPTION
METHOD AND FORM DESIGN, AND WORK PERIOD DURATION.
THE GENERAL FINDINGS WERE AGE AND SEX ARE
SIGNIFICANT FACTORS IN HAND TRANSCRIPTION ACCURACY,
THE AGE FACTOR INTERACTS SIGNIFICANTLY WITH CODE
CONTENT, THE SEX AND OCCUPATION FACTORS INTERACT
SIGNIFICANTLY. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-623 619

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

APPLICATION OF BEHAVIORAL SCIENCE TO PERFORMANCE AID
DEVELOPMENT. (U)

DESCRIPTIVE NOTE: STATE-OF-THE-ART REPT.,
AUG 65 20P TOPMILLER, DONALD A. ;
REPT. NO. AMRL-TR-65-146
PROJ: 7184
TASK: 718406

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•HUMAN FACTORS ENGINEERING, DISPLAY
SYSTEMS), (•DATA PROCESSING, HUMAN FACTORS ENGINEERING),
(•INSTRUCTION MANUALS, HUMAN FACTORS ENGINEERING),
NUMBERS, MAINTENANCE, MAINTAINABILITY, FAILURE, AIR
FORCE EQUIPMENT, SPECIFICATIONS, SYSTEMS ENGINEERING,
CHECKOUT PROCEDURES, SIMULATION, DESIGN (U)

FOUR CLASSES OF VARIABLES RELEVANT TO BEHAVIORAL
RESEARCH ON THE DEVELOPMENT OF PERFORMANCE AIDS
(TECHNICAL ORDERS, MAINTENANCE MANUALS, ETC.) ARE
OUTLINED: (A) LEGIBILITY AND FORMAT
VARIABLES; (B) VARIABLES ASSOCIATED WITH
PROCESSING PRINTED NUMERIC INFORMATION;
(C) VARIABLES ASSOCIATED WITH THE PHYSICAL
CONFIGURATION OF PERFORMANCE AIDS; AND, (D)
VARIABLES ASSOCIATED WITH TROUBLESHOOTING
INFORMATIONAL PROCESSING AND DISPLAY SYSTEMS.
EACH OF THESE TOPICS IS DISCUSSED WITHIN A
HISTORICAL FRAMEWORK, WITH SUPPORTING EMPIRICAL
RESEARCH. SOME PREDICTIONS ARE MADE FOR FUTURE
TRENDS IN PERFORMANCE-AID BEHAVIORAL STUDIES.
(AUTHOR) (U)

UNCLASSIFIED

DJC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-628 206 5/2 5/5
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

HUMAN ENGINEERING THE GPDS/LUCID SYSTEM:
CONSIDERATIONS AND PLANS. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,
NOV 65 JOP SIMON, CHARLES W. ;
REPT. NO. TM-2776,
CONTRACT: AF 19(628)-5166.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•INFORMATION RETRIEVAL, DISPLAY SYSTEMS),
(•HUMAN FACTORS ENGINEERING, INFORMATION RETRIEVAL),
DATA, DATA STORAGE SYSTEMS, SYSTEMS, PROGRAMMING
LANGUAGES (U)
IDENTIFIERS: LUCID LANGUAGE, ON-LINE SYSTEMS, USER
NEEDS (U)

HUMAN ENGINEERING CONSIDERATIONS AND PLANS FOR THE
STUDY AND EVALUATION OF THE GPDS/LUCID SYSTEM ARE
DISCUSSED. SPECIFIC PROJECT GOALS ARE: (1) TO
DETERMINE HOW WELL THE CURRENT SYSTEMS MATCH USERS'
NEEDS, AND (2) TO MAKE RECOMMENDATIONS FOR
IMPROVING THE SYSTEM WHERE THESE NEEDS ARE NOT MET.
AN ULTIMATE PROJECT GOAL WILL BE TO DETERMINE HUMAN
ENGINEERING DESIGN PRINCIPLES USEFUL FOR THE
DEVELOPMENT OF USER-ORIENTED, ON-LINE INFORMATION
PROCESSING SYSTEMS IN GENERAL. PROJECT
INVESTIGATION WILL EXAMINE THE GPDS/LUCID SYSTEMS
FROM THE POINT OF VIEW OF A USER WHO IS ESSENTIALLY
UNSOPHISTICATED IN COMPUTER PROGRAMMING.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-631 182 5/8 5/5 22/2 9/2
COMPUTER CONCEPTS INC LOS ANGELES CALIF

THE ROLE OF COMPUTERS IN HANDLING AEROSPACE SYSTEMS
HUMAN FACTORS TASK DATA. (U)

DESCRIPTIVE NOTE: FINAL REPT. 3 JUN 64-. JUN 65,
DEC 65 183P WHITEMAN, IRVIN R. ;
CONTRACT: AF 33(615)-1557,
PROJ: AF-1710,
TASK: 171006,
MONITOR: AMRL , TR-65-206

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-621 379.

DESCRIPTORS: (*DATA PROCESSING, HUMAN), (*HUMAN FACTORS
ENGINEERING, WEAPON SYSTEMS), (*SPACE FLIGHT, SYSTEMS
ENGINEERING), (*AIR FORCE, SYSTEMS ENGINEERING),
MANAGEMENT ENGINEERING, PERSONNEL MANAGEMENT, DECISION
MAKING, AUTOMATION, INFORMATION RETRIEVAL, SUPERVISORS,
COMPUTERS, DATA STORAGE SYSTEMS, PERFORMANCE(HUMAN):
GROUND SUPPORT EQUIPMENT (U)

THE CHARACTERISTICS OF A COMPUTER BASED DATA SYSTEM
FOR HANDLING HUMAN FACTORS TASK INFORMATION GENERATED
IN SUPPORT OF ADVANCED SYSTEM DEVELOPMENT ARE
DESCRIBED. ON THE BASIS OF INFORMATION GATHERED
FROM USERS AND GENERATORS OF DATA AT REPRESENTATIVE
GOVERNMENT AND CONTRACTOR INSTALLATIONS, THE
CURRENT AND POTENTIAL USES OF COMPUTERS WERE ASSESSED
TO DETERMINE THE DESIRABLE CHARACTERISTICS FOR A
COMPUTERIZED HUMAN FACTORS TASK DATA HANDLING SYSTEM.
THE PROPOSED DATA HANDLING SYSTEM WILL ASSIST
HUMAN FACTORS SPECIALIST AND SYSTEM DESIGN ENGINEERS
IN THE DESIGN AND DEVELOPMENT OF SYSTEMS BY PROVIDING
THEM WITH MEANS FOR: (1) DRAWING THEM CLOSER TO
THE DATA THROUGH A USER-ORIENTED SYSTEM, (2)
COMPARING DATA GENERATED THROUGHOUT THE LIFE-CYCLE OF
AN ADVANCED SYSTEM AND ACROSS SYSTEMS, (3)
ANALYZING DATA AND CONDUCTING MAN-MACHINE
SIMULATIONS, AND (4) INSURING THAT DATA ARE MADE
AVAILABLE ON A SELECTIVE QUERY AND A TIMELY BASIS.
THESE OBJECTIVES ARE MET WITHIN THE FRAMEWORK OF A
DATA SYSTEM CONCEPT REFERRED TO AS CENTRAL. THE
FUNCTIONS OF CENTRAL ARE: (1) DATA STORAGE AND
RETRIEVAL, (2) DATA PROCESSING, (3) COMPUTER
PROGRAM MAINTENANCE, AND (4) SYSTEM OPERATIONAL
MANUAL MAINTENANCE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-631 465 9/3 17/2 5/9
WESTON INSTRUMENTS INC NEWARK N J

STUDY OF ELECTROLUMINESCENT DISPLAY TECHNIQUES AND
EVALUATION OF A THIN FILM CROSS-GRID DISPLAY PANEL. (U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 64-SEP 65,
DEC 65 53P LAKSHMANAN, T. K. ; MUNT, I. ;
CONTRACT: AF 33(615)-1876,
PROJ: AF-6114,
TASK: 611410,
MONITOR: AMRL , TR-65-166

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*DISPLAY SYSTEMS, *ELECTROLUMINESCENCE),
FILMS, STATE-OF-THE-ART REVIEWS, MANUFACTURING,
RESOLUTION, BRIGHTNESS, LIFE EXPECTANCY, SIMULATION,
HUMAN FACTORS ENGINEERING, CIRCUITS, COMPUTERS, TRAINING
DEVICES (U)

IDENTIFIERS: ELECTROLUMINESCENCE, PANELS, THIN
FILMS (U)

A STUDY WAS CONDUCTED OF THE STATE-OF-THE-ART OF
ELECTROLUMINESCENT DISPLAY TECHNIQUES APPLICABLE TO
SIMULATION OF ON-BOARD DISPLAYS OF FUTURE VEHICLES
AND DISPLAYING COMPUTER AND/OR VIDEO INFORMATION FOR
USE IN TRAINING DEVICES. AN EVALUATION WAS MADE OF
THE VARIOUS FABRICATION TECHNIQUES TO DETERMINE THE
ONE WITH GREATEST POTENTIAL FOR PRODUCING A HIGH
RESOLUTION, BRIGHT CROSS-GRID TYPE PANEL DISPLAY.
A THIN FILM CROSS-GRID PANEL, 9 IN. X 9 IN. WITH
258 X 258 LINES WAS FABRICATED AND EVALUATED TO
DETERMINE OPERATIONAL CHARACTERISTICS AND
LIMITATIONS. SOME BASIC CONSIDERATIONS WERE GIVEN
TO DRIVING ELECTRONICS TO DETERMINE DESIGNS FOR
MAXIMUM FLEXIBILITY FOR COMPUTER GENERATED INPUTS.
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-631 781 15/7 5/10 9/2
OHIO STATE UNIV COLUMBUS HUMAN PERFORMANCE CENTER

FURTHER INVESTIGATION OF THE EFFECTS OF REDUCED INPUT
DATA FIDELITY UPON THE DETERMINATION OF POSTERIOR
PROBABILITIES IN A SIMULATED THREAT-DIAGNOSIS
SYSTEM. (U)

DESCRIPTIVE NOTE: FINAL REPT., 15 MAR-1 AUG 64,
DEC 65 21P SCHUM, DAVID A. ; GOLDSTEIN,
IRWIN L. ; SOUTHARD, JACK F. ;
CONTRACT: AF 33(657)-10763,
PROJ: AF-7184,
TASK: 718403,
MONITOR: AMRL , TR-65-233

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-607 256, -608 108, -615
758.

DESCRIPTORS: (*THREAT EVALUATION, *DECISION MAKING),
(*STATISTICAL ANALYSIS, MILITARY INTELLIGENCE),
COMPUTERS, SIMULATION, PROBABILITY, MATHEMATICAL
PREDICTION, HUMAN FACTORS ENGINEERING, DATA PROCESSING (U)
IDENTIFIERS: BAYES THEOREM (U)

THIS IS THE FIFTH IN A SERIES OF EXPERIMENTS ON
BAYESIAN DIAGNOSTIC SYSTEMS. IN THIS EXPERIMENT
TWO PROCEDURES FOR OBTAINING A POSTERIORI (P (H/D))
PROBABILITY ESTIMATES WERE COMPARED UNDER CONDITIONS
OF LOW FIDELITY OF INPUT DATA AND VARIOUS LEVELS OF
TIME-STRESS. IN ONE PROCEDURE A COMPUTER
AGGREGATED THE SUBJECTS' A PRIORI (P (D/H))
ESTIMATES. IN THE ALTERNATE PROCEDURE THE A
POSTERIORI PROBABILITIES WERE ESTIMATED BY THE
SUBJECTS WITHOUT COMPUTER AID. THE RESULTS FAVOR
THE COMPUTER-AIDED PROCEDURE AND TEND TO SUPPORT THE
USE OF AUTOMATED BAYESIAN HYPOTHESIS-SELECTION
PROCEDURES IN DIAGNOSTIC SYSTEMS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-634 313 15/3 17/2 5/5
ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C

HUMAN FACTORS RESEARCH IN COMMAND INFORMATION
PROCESSING SYSTEMS,

(U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH REPT.,
MAR 66 27P RINGEL, SEYMOUR ; VICINO, F.
L. ; ANDREWS, R. S. ;
REPT. NO. APR0-TRR-1145
PROJ: DA-2-J-024701-A-723

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*COMMAND AND CONTROL SYSTEMS, DECISION
MAKING), (*COMBAT INFORMATION CENTERS, *HUMAN FACTORS
ENGINEERING), DATA PROCESSING, DISPLAY SYSTEMS, MILITARY
REQUIREMENTS, MILITARY TACTICS, COMPUTERS, INFORMATION
RETRIEVAL (U)

THE REPORT DESCRIBES THE SCOPE, RATIONALE,
ORGANIZATION, AND PROGRESS OF A COMMAND SYSTEMS
RESEARCH PROGRAM TO PROVIDE HUMAN FACTORS INFORMATION
NEEDED FOR PERFORMANCE WITHIN COMPLEX AUTOMATED
INFORMATION PROCESSING SYSTEMS. FOLLOWING A SURVEY
OF MILITARY INFORMATION PROCESSING EQUIPMENT AND
OPERATIONS AND FUTURE PLANS FOR COMMAND INFORMATION
PROCESSING SYSTEMS, BASIC HUMAN FACTORS PROBLEMS WERE
IDENTIFIED AND ORGANIZED AROUND FIVE CRITICAL
OPERATIONS--SCREENING INCOMING DATA, TRANSFORMING RAW
DATA FOR INPUT INTO STORAGE DEVICES, INPUT,
ASSIMILATION OF DISPLAYED INFORMATION, AND DECISION
MAKING. A RESEARCH PROGRAM WAS FORMULATED AND
STUDIES UNDERTAKEN TO YIELD EMPIRICAL INFORMATION
ABOUT THE EFFECTS ON HUMAN PERFORMANCE OF (1)
CHARACTERISTICS OF THE INFORMATION PRESENTED
(DENSITY, AMOUNT, ETC.); (2) DYNAMIC ASPECTS OF
INFORMATION (TYPE, EXTENT, CODING OF UPDATES);
(3) DISPLAY MODES AND SENSORY MODALITIES (GROUP
VS INDIVIDUAL DISPLAYS, MULTISENSORY DISPLAYS); AND
(4) COMPUTER AIDS TO THE DECISION PROCESS. A
COMMAND SYSTEMS LABORATORY WAS DEVELOPED TO
PERMIT SIMULATION OF VARIOUS TOS FUNCTIONS.
FINDINGS HAVE SUGGESTED THE POSSIBILITY OF
REDUCTION IN STORAGE CAPACITY REQUIREMENTS, NUMBER OF
DISPLAYS CALLED FROM STORAGE DURING A GIVEN
OPERATIONAL TIME PERIOD, AND TIME REQUIRED FOR THE
TOTAL INFORMATION ASSIMILATION-DECISION PROCE S AND
SUPPORTED THE INCORPORATION AND USE OF INFORM I, ON
CONSPICUITY CODING CAPABILITIES IN COMMAND SYSTEMS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-636 170 5/5 5/8 9/2
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA RESEARCH AND
ENGINEERING SUPPORT DIV

HUMAN FACTORS PROBLEMS IN COMPUTER-GENERATED GRAPHIC
DISPLAYS. (U)

APR 66 118P BARMACK, JOSEPH E. ;SINAIKO,
H. WALLACE ;
REPT. NO. IDA/HQ-66-4820, STUDY S-234
CONTRACT: SD-50,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•HUMAN FACTORS ENGINEERING, DISPLAY
SYSTEMS), (•DISPLAY SYSTEMS, GRAPHICS), COMPUTERS, MAN
MACHINE SYSTEMS, INPUT OUTPUT DEVICES, THEORY, LIGHT,
COLORS (U)

THE STUDY IS A REVIEW OF CURRENT PRACTICES IN
COMPUTER-GENERATED GRAPHIC DISPLAYS FROM THE POINT OF
VIEW OF ENGINEERING PSYCHOLOGY. INPUT DEVICES,
WHICH ARE INTEGRAL TO MAN-COMPUTER SYSTEMS, ARE ALSO
CONSIDERED. THEORIES OF COGNITION ARE EXAMINED
WITH RESPECT TO THEIR APPLICABILITY TO COMPUTER-
GRAPHICS. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-636 313 6/4 9/2
SYSTEM RESEARCH LTD RICHMOND (ENGLAND)

A CYBERNETIC MODEL OF HUMAN DATA PROCESSING. (U)

64 16P PASK, GORDON ;
CONTRACT: AF 61(052)-640, AF 61(052)-402

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PRESENTATION AT THE
PROCEEDINGS OF THE INTERNATIONAL UNION OF
PHYSIOLOGICAL SCIENCES, INTERNATIONAL CONGRESS
(22ND) IN LEIDEN, 1962 P218-33.

DESCRIPTORS: (*CYBERNETICS, BEHAVIOR), (*BIONICS,
BEHAVIOR), HUMANS, DATA PROCESSING, LEARNING, MAN
MACHINE SYSTEMS, GREAT BRITAIN (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-637 814 5/2 5/5 15/7
ARMY PERSONNEL RESEARCH OFFICE WASHINGTON D C

COMMAND INFORMATION PROCESSING SYSTEMS: A HUMAN
FACTORS RESEARCH PROGRAM.

(U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH REPT.
JUN 66 38P RINGEL, SEYMOUR ;
REPT. NO. APRO-TRR-1149
PROJ: DA-2-J-024701-A-723

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*INFORMATION RETRIEVAL, ARMY OPERATIONS),
(*HUMAN FACTORS ENGINEERING, INFORMATION RETRIEVAL),
TACTICAL WARFARE, DATA PROCESSING, COMMAND AND CONTROL
SYSTEMS, MAN MACHINE SYSTEMS, COMPUTERS, MILITARY
STRATEGY, DECISION MAKING, SYSTEMS ENGINEERING (U)

THE COMMAND SYSTEMS TASK SEEKS TO DEVELOP
RESEARCH INFORMATION BY WHICH THE EFFECTIVENESS OF
CURRENT AND FUTURE COMMAND INFORMATION PROCESSING
SYSTEMS MAY BE MAXIMIZED, PURSUING ITS OBJECTIVE
THROUGH INTENSIVE EXPERIMENTATION IN SPECIFIC ARMY
MAN-MACHINE COMPLEXES. THE PRESENT PUBLICATION
DESCRIBES THE SCOPE, RATIONALE, AND ORGANIZATION OF A
RESEARCH PROGRAM TO PROVIDE THAT INFORMATION TO
DESIGNERS, DEVELOPERS, AND USERS. THE PROGRAM
REPRESENTS A COMPREHENSIVE APPROACH TO RESEARCH
CONCERNED WITH AUTOMATED COMMAND INFORMATION
PROCESSING SYSTEMS, RANGING FROM DETAILED STUDIES OF
DISCRETE HUMAN FUNCTIONS TO INTEGRATION OF SIZABLE
HIGHLY AUTOMATED COMPUTERIZED SYSTEMS. TASK EFFORT
FOR THE PRESENT AND IN THE IMMEDIATE FUTURE WILL BE
CONCENTRATED ON STUDIES DEALING WITH INFORMATION
ASSIMILATION AND DECISION MAKING. THE REPORT
DELINEATES A SERIES OF STUDIES IN PROGRESS OR
PROJECTED ON NINE MAJOR ASPECTS OF THESE FUNCTIONS:
(1) AMOUNT AND DENSITY OF INFORMATION; (2)
SPECIFICITY OF INFORMATION; (3) ALPHA-NUMERIC
AND SYMBOLIC PRESENTATION; (4) TYPE, EXTENT, AND
RATE OF INFORMATION UPDATING; (5) CODING OF
UPDATED INFORMATION AND HARD COPY; (6) SEQUENCE
OF INFORMATION PRESENTATION; (7) INDIVIDUAL AND
GROUP WORK METHODS AND DISPLAYS; (8) VISUAL AND
AUDITORY DISPLAYS; (9) COMPUTER-AIDED
PERFORMANCE. RESEARCH TO BE ACCOMPLISHED IN
REMAINING SUBTASKS CONCERNED WITH PROBLEMS IN THE
INFORMATION PREPARATION AND SYSTEM INTEGRATION AREAS
IS MORE GENERALLY DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-640 283 5/2 5/8 9/2
INTERNATIONAL BUSINESS MACHINES CORP POUGHKEEPSIE N Y DATA
SYSTEMS DIV

PSYCHOLOGY FOR A MAN-MACHINE PROBLEM-SOLVING
SYSTEM.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
FEB 65 22P MILLER, ROBERT B. ;
REPT. NO. TR-00-1246,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*PROBLEM SOLVING, MAN MACHINE SYSTEMS),
(*INFORMATION RETRIEVAL, MAN MACHINE SYSTEMS),
COMPUTERS, HUMAN FACTORS ENGINEERING, SUBJECT INDEXING,
PSYCHOLOGY (U)

THE PAPER DEALS WITH THE USE OF COMPUTER
CAPABILITIES TO EXTEND HUMAN CAPABILITIES FOR
INVENTION AND DISCOVERY. A PROGRAMMATIC ROUTE IS
PROPOSED FOR DEVELOPMENT. THE FIRST STAGE IN THIS
ROUTE IS AN ANALYTIC ENUMERATION OF HUMAN ABILITIES
AND LIABILITIES AS A PROBLEM-SOLVING MECHANISM.
THE SECOND STAGE WILL DEAL WITH AN ANALYSIS OF
HUMAN INFORMATION-HANDLING TASKS. THESE TWO STAGES
SHOULD ILLUMINATE SYSTEM OBJECTIVES, WHILE AT THE
SAME TIME OPTIONS FOR DESIGNING THE MAN-MACHINE
PROBLEM-SOLVING ENTITY BECOME CLARIFIED. THE
RESULT WILL BE AN INTELLIGENCE-RETRIEVAL SYSTEM
COMBINED WITH LOGICAL AND EXTRAORDINARY DISPLAY
CAPABILITIES. THE PRINCIPAL DESIGN ISSUES WILL BE
REVEALED AS INDEXING CONTENT AND STRUCTURE AND
DISPLAY SYMBOLOGIES. AN IMPORTANT (AND
NEGLECTED) DIMENSION IN SYSTEM DESIGN IS THE
HUMAN'S ABILITY TO LEARN AND THINK IN NEW LANGUAGES
AND SYMBOLOGIES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-644 636 1/4 5/5
BUNKER-RAMO CORP CANOGA PARK CALIF DEFENSE SYSTEMS
DIV

HUMAN ENGINEERING SUPPORT TO AIR FORCE FLIGHT CONTROL
AND FLIGHT DISPLAY INTEGRATION PROGRAM. (U)

DESCRIPTIVE NOTE: FINAL REPT., 14 MAR-24 JUN 66,
OCT 66 50P HABIDEAU, GERALD F. ISEMPLER,
CLARENCE A. ;
CONTRACT: AF 33(615)-3757
PROJ: AF-6190
TASK: 619007
MONITOR: AFFDL TR-66-157

UNCLASSIFIED REPORT

DESCRIPTORS: (*FLIGHT CONTROL SYSTEMS, HUMAN FACTORS
ENGINEERING), (*DISPLAY SYSTEMS, AIRCRAFT), COCKPITS,
VISIBILITY, INFORMATION RETRIEVAL, AIR FORCE RESEARCH,
SHORT TAKEOFF AIRCRAFT, ALTIMETERS (U)

AMONG THE RESEARCH OUTPUTS WERE (1) A HEAD-UP
DISPLAY LITERATURE SEARCH AND ANALYSIS, AND (2)
EXPERIMENTAL DESIGN FOR DYNAMIC (OPEN-LOOP)
STUDY OF MOVING TAPE SCALE VARIABLES. AMONG THE
CONTINUING RESEARCH TASKS WERE: (1) VISUAL
REQUIREMENTS IN COCKPIT DISPLAYS UNDER LOW AMBIENT
ILLUMINATION, (2) SWITCH TYPE AND LOCATION
EVALUATION FOR CONTROL YOKE, (3) V/STOL LANDING
DISPLAY LITERATURE SEARCH, AND (4) CONTROL-
DISPLAY INFORMATION CENTER SUBJECTIVE INDEX
DEVELOPMENT. ADDITIONALLY, THE MORE EXTENSIVE
CONSULTING TASKS INCLUDED: (1) V/STOL PROGRAM
DEVELOPMENT, (2) ADVANCED MULTIPURPOSE SPACECRAFT
DISPLAY STUDY, (3) V/STOL PANEL AND COCKPIT
MOCKUP SUPPORT, AND (4) ELECTROLUMINESCENT
ALTIMETER DESIGN CONCEPT EVALUATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-645 653 9/2 5/5
NAVY ELECTRONICS LAB SAN DIEGO CALIF

HUMAN FACTORS IN THE DESIGN OF AN OBSERVER'S
KEYSET.

(U)

DESCRIPTIVE NOTE: RESEARCH REPT., JAN-AUG 66,
OCT 66 40P GALLO, P. S.; LEVINE, J. R. ;
REPT. NO. NEL-1411
PROJ: SR-006-09-02
TASK: 11281(NEL N51461)

UNCLASSIFIED REPORT

DESCRIPTORS: (*INPUT OUTPUT DEVICES, *HUMAN FACTORS
ENGINEERING), DESIGN, PUNCHED TAPE, COMPUTERS, RECORDING
SYSTEMS, DATA TRANSMISSION SYSTEMS (U)

THE REPORT DESCRIBES AN INVESTIGATION OF THE
EFFECTS OF CHANGES IN A NUMBER OF DESIGN
CHARACTERISTICS AND OTHER VARIABLES ON OPERATION WITH
KEYSETS USED TO RECORD INFORMATION IN BINARY NOTATION
FROM STIMULUS DISPLAYS THAT CONTAIN A MAXIMUM OF FIVE
BITS OF INFORMATION PER STIMULUS. PRINCIPAL RESULT
WAS A DEMONSTRATION OF SUPERIORITY IN TRANSMISSION
AND ERROR RATES OF FIVE-KEY PATTERN ENTRY OVER TWO-
KEY SEQUENTIAL ENTRY. OTHER VARIABLES TESTED WERE
LESS SIGNIFICANT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-646 960 5/8 5/10 9/4
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ENGINEERING PSYCHOLOGY, (U)

OCT 66 719P LEONTEVA, A. N. ; ZINCHENKO,
V. P. ; PANOVA, D. YU. ;
REPT. NO. FTD-HT-66-147
MONITOR: TT 67-61001

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF MONO.
INZHENERNAYA PSIKHOLOGIYA, MOSCOW, 1964 396P.

DESCRIPTORS: (MAN MACHINE SYSTEMS, APPLIED PSYCHOLOGY),
INFORMATION THEORY, ELECTROPHYSIOLOGY, HUMAN FACTORS
ENGINEERING, PERCEPTION (PSYCHOLOGY), PSYCHOPHYSIOLOGY,
AUTOMATION, BRAIN, AUDITORY PERCEPTION, VISUAL
PERCEPTION, MEMORY (PSYCHOLOGY), MOTOR REACTIONS, NOISE,
PERFORMANCE (HUMAN), USSR (U)

THE PROBLEMS OF ENGINEERING PSYCHOLOGY, AUTOMATION,
AND THE BASIC THEORIES OF INFORMATION THEORY, OF THE
SYSTEM OF ABSTRACTIONS USED IN IT, AND OF THE
CONDITIONS OF ITS APPLICABILITY IN PSYCHOLOGY ARE
DISCUSSED. THE DETAILED DYNAMICS OF PERCEPTION ARE
EXAMINED IN ORDER TO FIND OUT HOW AND BY WHAT MEANS
OF WHAT FUNCTIONAL STRUCTURES THE SENSORY CONTENT AND
THE ABBREVIATED DESCRIPTION OF THE IDENTIFIED
STIMULUS ARE FORMED AND FIXED IN THE FORM OF AN
ENSEMBLE OF INVARIANT, MUTUALLY INDEPENDENT
PARAMETERS, PERMITTING THE REALIZATION OF
SIMULTANEOUS RECOGNITION OR DIFFERENTIATION. A
METHOD IS DESCRIBED, BY USING FORMULAS, OF
QUANTITATIVE ANALYSIS OF THE PERCEPTION OF SPATIAL
AND SPATIO-TEMPORAL RELATIONS. IT IS INDICATED
THAT THE OBSERVER IS A PERSON WHO FOLLOWS UP A SYSTEM
OF SIGNALS APPEARING AGAINST THE BACKGROUND OF SIDE
EFFECTS, WHICH CONSTITUTES INTERFERENCES WITH RESPECT
TO THESE SIGNALS. SEVERAL METHODS AND SYSTEMS FOR
ANALYZING BRAIN BIOCURRENTS ARE DISCUSSED. THE
DISTRIBUTION OF FUNCTIONS BETWEEN MAN AND MACHINE ARE
EXAMINED AS WELL AS INTERACTION OF INDIVIDUALS IN THE
CONTROL SYSTEM, HUMAN THROUGHPUT CAPACITY, BASIC
FEATURES OF HUMAN OPERATOR ACTIVITY, STATE OF
RECEPTION AND CODING OF INFORMATION, AND BASIC TYPES
OF OPERATOR ACTIVITY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-647 993 5/2 5/5
SYSTEM DEVELOPMENT CORP DAYTON OHIO

DEVELOPMENT AND APPLICATION OF COMPUTER SOFTWARE
TECHNIQUES TO HUMAN FACTORS TASK DATA HANDLING
PROBLEMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 21 JUN 65-21 JUN 66,
DEC 66 175P POTTER, K. W. ; TULLEY, A.
T. ; REED, LAWRENCE E. ;
CONTRACT: AF 19(628)-3418
PROJ: AF-1710
TASK: 171006
MONITOR: AMRL TR-66-200

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: JOINT NASA/USAF STUDY.

DESCRIPTORS: (*DATA PROCESSING, *HUMAN FACTORS
ENGINEERING), INFORMATION RETRIEVAL, COMPUTERS,
CLASSIFICATION, VOCABULARY, DATA STORAGE SYSTEMS

(U)

RESEARCH LEADING TO THE APPLICATION OF COMPUTER
SOFTWARE TECHNIQUES FOR HANDLING HUMAN FACTORS TASK
DATA GENERATED IN SUPPORT OF AEROSPACE SYSTEM
DEVELOPMENT PROGRAMS IS DISCUSSED. IT IS
RECOGNIZED THAT DATA HANDLING TECHNIQUES MUST BE
DEVELOPED IN CONTEXT WITH THEIR TOTAL OPERATIVE
ENVIRONMENT. A CONCEPT OF AN OPERATIONAL DATA
MANAGEMENT SYSTEM FOR STORING, PROCESSING, AND
RETRIEVING HUMAN FACTORS TASK DATA IN A GOVERNMENT/
CONTRACTOR ENVIRONMENT IS DISCUSSED AND ILLUSTRATED.
THIS CONCEPT IS PREDICATED ON THE ASSUMPTION THAT A
USER-ORIENTED COMPUTERIZED DATA SYSTEM WILL HELP DRAW
HUMAN FACTORS SPECIALISTS CLOSER TO THEIR DATA.
FIVE PROBLEM AREAS, CONSIDERED TO BE FUNDAMENTAL TO
THE DEVELOPMENT OF DATA HANDLING TECHNIQUES, WERE
RESEARCHED. THESE AREAS ARE: (1) ANALYSIS
OF HUMAN FACTORS TASK DATA, DATA RELATIONSHIPS, AND
CLASSIFICATION SCHEMES, (2) APPLICATION OF
VOCABULARY AND THESAURUS TECHNIQUES TO INCREASE THE
EFFECTIVENESS OF COMMUNICATION AMONG MAN/MACHINE/
SOFTWARE FUNCTIONS, (3) APPLICATION OF COMPUTER
STORAGE AND RETRIEVAL TECHNIQUES TO HUMAN FACTORS
TASK DATA, (4) APPLICATION OF ANALYTICAL AND
SIMULATION TECHNIQUES TO HUMAN FACTORS TASK DATA, AND
(5) APPLICATION OF CURRENT AWARENESS TECHNIQUES
TO PROVIDE NOTIFICATIONS OF DATA AVAILABILITY.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-650 791 5/10
NAVAL MATERIAL COMMAND WASHINGTON D C

SYMPOSIUM ON HUMAN PERFORMANCE QUANTIFICATION IN
SYSTEMS EFFECTIVENESS, JANUARY 17-18, 1967,
WASHINGTON, D. C. (PROCEEDINGS);

(U)

67 338P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
NATIONAL ACADEMY OF ENGINEERING, WASHINGTON, D.
C.

DESCRIPTORS: (*PERFORMANCE(HUMAN), NAVAL PERSONNEL),
(*SYSTEMS ENGINEERING, SYMPOSIA), EFFECTIVENESS, MAN
MACHINE SYSTEMS, NAVAL RESEARCH, HUMAN FACTORS
ENGINEERING, BEHAVIOR, OPERATIONS RESEARCH, SIMULATION,
PREDICTIONS, 9COMPUTERS, RELIABILITY (U)

THE SYMPOSIUM WAS ORGANIZED TO BRING TOGETHER A
GROUP OF ENGINEERS AND SCIENTISTS FROM MANY SECTIONS
OF THE COUNTRY WHO HAVE BEEN ACTIVELY INVESTIGATING
THE RELATIONSHIP OF HUMAN OPERATORS TO THE
EFFECTIVENESS OF COMPLEX MAN/MACHINE SYSTEMS. THE
SPECIFIC OBJECTIVES OF THE SYMPOSIUM WERE TO:
REVIEW AND EVALUATE CURRENT AND PROPOSED METHODS FOR
QUANTIFYING MAN'S ROLE IN THE PERFORMANCE OF COMPLEX
MAN/MACHINE SYSTEMS. ACQUAINT THE ENGINEERING
COMMUNITY AND PARTICULARLY SCIENTISTS AND ENGINEERS
WITHIN THE NAVY WITH THE PROBLEMS AND PAYOFFS
RELATED TO QUANTIFICATION OF HUMAN PERFORMANCE IN
NAVY SYSTEMS. DEVELOP A SET OF RECOMMENDATIONS FOR
APPLICATION BY THE NAVAL MATERIAL COMMAND AND
OTHER ENGINEERING DEVELOPMENT ORGANIZATIONS TO ENSURE
CONSIDERATION, DURING ALL PHASES OF SYSTEM
DEVELOPMENT, OF HUMAN CONTRIBUTION TO SYSTEM
PERFORMANCE EFFECTIVENESS. THESE OBJECTIVES HAVE
BEEN ATTAINED THROUGH THE EFFORTS OF THOSE WHO HAVE
CONDUCTED RESEARCH AND DEVELOPMENT ACTIVITIES AND
REPORTED THEM HERE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-650 918 4/2
SYLVANIA ELECTRONIC SYSTEMS EAST WALTHAM MASS APPLIED
RESEARCH LAB

AN INVESTIGATION OF HUMAN PROCESSING OF INFORMATION
IN WEATHER FORECASTING. (U)

DESCRIPTIVE NOTE: FINAL REPT., 15 MAY 65-14 NOV 66,
JAN 67 152P DEVOE, DONALD B. ;
REPT. NO. F-5151-1
CONTRACT: AF 19(628)-5176
PROJ: AF-7682
TASK: 768203
MONITOR: ESD TR-67-218

UNCLASSIFIED REPORT

DESCRIPTORS: (*WEATHER FORECASTING, SYSTEMS
ENGINEERING), (*MAN MACHINE SYSTEMS, WEATHER STATIONS),
DATA PROCESSING, SIMULATION, DISPLAY SYSTEMS, HUMAN
FACTORS ENGINEERING, EFFECTIVENESS, DECISION MAKING (U)

AS AN APPROACH TO THE ANALYSIS OF HUMAN FUNCTIONS
IN COMPLEX SYSTEMS, TECHNIQUES WERE DEVISED AND
TESTED FOR ANALYZING INFORMATION PROCESSING BY
WEATHER FORECASTERS. THE FIELD INTERVIEW AS A
SOURCE OF INFORMATION ON THE UTILIZATION OF
CENTRALLY-PREPARED AIDS TO FORECASTING WAS EVALUATED
AT TWO AIR FORCE WEATHER STATIONS. THE
PRESENTATION OF WEATHER INFORMATION VIA A
FORECASTER'S CONSOLE WAS SIMULATED IN THE LABORATORY
AND TESTED EXPERIMENTALLY BOTH AS A MEANS FOR
ANALYZING INFORMATION PROCESSING BY FORECASTERS AND
AS A TEST BED FOR EVALUATING NEW APPROACHES TO THE
DISPLAY OF WEATHER INFORMATION. THE RESULTS OF THE
INTERVIEWS AND THE EXPERIMENT ARE DISCUSSED REGARDING
THEIR IMPLICATIONS FOR WEATHER FORECASTING AND FOR
RESEARCH METHODOLOGY, AND FURTHER STUDIES ARE
RECOMMENDED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-654 624 9/2 5/1
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

EXPERIMENTAL INVESTIGATION OF USER PERFORMANCE IN
TIME-SHARED COMPUTING SYSTEMS: RETROSPECT, PROSPECT,
AND THE PUBLIC INTEREST. (U)

DESCRIPTIVE NOTE: PROFESSIONAL PAPER,
MAY 67 105P SACKMAN, H. ;
REPT. NO. SP-2846
CONTRACT: F19628-67-C-0004

UNCLASSIFIED REPORT

DESCRIPTORS: (•TIME SHARING, DATA PROCESSING), (•DATA
PROCESSING, PERFORMANCE(HUMAN)), MAN MACHINE SYSTEMS,
MANAGEMENT PLANNING AND CONTROL, PREDICTIONS, PROBLEM
SOLVING, REVIEWS, HUMAN FACTORS ENGINEERING, REAL TIME,
STATISTICAL ANALYSIS (U)
IDENTIFIERS: EVALUATION, OFF-LINE SYSTEMS, ON-LINE
SYSTEMS (U)

THIS STUDY WAS CONDUCTED TO SURVEY THE FIELD OF
USER STUDIES IN TIME-SHARING, AND TO DEVELOP A
CONCEPTUAL FRAMEWORK FOR COOPERATIVE, LONG-RANGE
APPLIED RESEARCH IN THIS AREA--ULTIMATELY TO SERVE
THE PUBLIC INTEREST IN THE DEVELOPMENT OF THE
COMPUTER UTILITY. THE INTRODUCTION TRACES THE
HISTORICAL ROOTS OF USER PROBLEMS AND DEVELOPS THE
NEED FOR EXPERIMENTAL STUDIES OF USER PERFORMANCE IN
TIME-SHARING SYSTEMS. THE LITERATURE REVIEW
REVEALS A LARGE AND GROWING EXPERIMENTAL LAG BETWEEN
THE EXTENSION OF INFORMATION SERVICES AND VERIFIED
KNOWLEDGE OF USER PERFORMANCE. A CONCEPTUAL
FRAMEWORK FOR USER STUDIES IN TIME-SHARING IS
CONSTRUCTED FOLLOWING THREE BASIC STEPS. THE FIRST
DEFINES THIS FIELD OF INQUIRY. THE DEFINITION
ESSENTIALLY PORTRAYS THIS AREA AS EXPERIMENTALLY
DERIVED TECHNIQUES AND FINDINGS COMPRISING THE SHARED
AND VERIFIED EXPERIENCES OF THE USER COMMUNITY.
THE SECOND STEP BUILDS AN EVOLUTIONARY SYSTEMS
FRAMEWORK FOR USER STUDIES, ENCOMPASSING THE DESIGN,
DEVELOPMENT AND OPERATION OF USER SYSTEMS, AND
RELATING TIME-SHARED USER SYSTEMS TO OTHER TYPES OF
COMPUTER-AIDED SYSTEMS. THE LAST IS A
CLASSIFICATION OF USER PROBLEMS INTO FOUR BROAD
AREAS--METHODOLOGICAL, NORMATIVE, BEHAVIORAL, AND
SOCIAL EFFECTIVENESS. NUMEROUS PROBLEMS,
HYPOTHESES AND RECOMMENDATIONS FOR EXPERIMENTAL
INVESTIGATION OF USER PERFORMANCE ARE MADE FOR EACH
OF THESE FOUR CATEGORIES. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-655 375 5/8 13/8 9/2
MASSACHUSETTS INST OF TECH CAMBRIDGE ENGINEERING PROJECTS
LAB

A COMPUTER SIMULATION EXPERIMENT OF SUPERVISORY
CONTROL OF REMOTE MANIPULATION. (U)

DESCRIPTIVE NOTE: FINAL REPT.,
APR 67 76P MCANDLISH, SIMON G. ;
REPT. NO. DSR-79960-5
CONTRACT: AF 19(628)-3317
PROJ: AF-7682
TASK: 768204
MONITOR: ESD TR-67-290

UNCLASSIFIED REPORT

DESCRIPTORS: (*AUTOMATION, *MAN MACHINE SYSTEMS),
(*DECISION MAKING, HUMAN FACTORS ENGINEERING),
(*COMPUTERS, SIMULATION), REAL TIME, SUBROUTINES,
DISPLAY SYSTEMS, CONTROL, INPUT OUTPUT DEVICES (U)

THE LONG TERM AIM OF THIS WORK IS THE MODELING OF THE PROCESS BY WHICH THE HUMAN COMMANDS AND CONTROLS A REAL-TIME INFORMATION SYSTEM CONTAINING AUTOMATIC SUBROUTINES WHICH MAY BE USED TO ACCOMPLISH PORTIONS OF THE TASK. REMOTE MANIPULATION IS BELIEVED TO HAVE ALL THE TYPICAL ATTRIBUTES OF SUCH A SYSTEM YET BE SIMPLE ENOUGH TO BE AMENABLE TO LABORATORY INVESTIGATION. THIS REPORT DESCRIBES A COMPUTER SIMULATION OF A REMOTE MANIPULATION TASK AND RATE-CONTROLLED MANIPULATOR; INTO THE LATTER WAS BUILT SOME LOW-LEVEL AUTOMATIC DECISION MAKING ABILITY WHICH COULD BE USED AT THE OPERATOR'S DISCRETION TO AUGMENT HIS DIRECT CONTINUOUS CONTROL. UNDER EXPERIMENTAL INVESTIGATION WERE THE EFFECT OF TRANSMISSION DELAY, DYNAMIC LAG AND INTERMITTENT VISION ON HUMAN MANIPULATIVE ABILITY. THIS REPORT DESCRIBES FURTHER EXPERIMENTS IN WHICH THE OPERATOR CALLED IN SEQUENCE VARIOUS ON-SITE AUTOMATIC CONTROL PROGRAMS OF THE MACHINE, AND THEREBY ACTED AS A SUPERVISOR. THE RESULTS SUGGEST THAT THE SUPERVISORY MODE OF OPERATION HAS SOME ADVANTAGES WHEN THE TASK TO BE PERFORMED IS DIFFICULT FOR A HUMAN CONTROLLING DIRECTLY. RESULTS SHOW THE SUPERVISORY MODE TO REQUIRE MORE TRAINING THAN THE DIRECT MODE. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-656 533 5/8 5/5 5/10
MICHIGAN UNIV ANN ARBOR DEPT OF PSYCHOLOGY

HUMAN INFORMATION-PROCESSING CONCEPTS FOR SYSTEM
ENGINEERS, (U)

65 19P PEW, RICHARD W. ;
CONTRACT: AF 49(638)-1235
PROJ: AF-920F-5002
MONITOR: AFOSR 67-1799

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN SYSTEM ENGINEERING
HANDBOOK P31-3-31-17 1965.

DESCRIPTORS: (•MAN MACHINE SYSTEMS, SYSTEMS
ENGINEERING), (•HUMAN FACTORS ENGINEERING, MAN MACHINE
SYSTEMS), MEMORY(PSYCHOLOGY), DECISION MAKING, DATA
PROCESSING, PSYCHOPHYSICS, PERCEPTION(PSYCHOLOGY) (U)

A DESIGN PHILOSOPHY IS PRESENTED FOR UTILIZING
INFORMATION ABOUT HUMAN PERFORMANCE CAPACITIES AND
LIMITATIONS IN THE DESIGN OF MAN-MACHINE SYSTEMS.
SPECIFIC DATA CONCERNING MAN'S CAPABILITIES FOR
PSYCHOPHYSICAL JUDGMENT, SPEEDED INFORMATION
PROCESSING, MEMORY STORAGE AND PERCEPTUAL MOTOR SKILLS
ARE SURVEYED AND DESCRIBED IN ENGINEERING TERMS WHERE
APPLICABLE. THE VIEW OF MAN AS A SINGLE CHANNEL
LIMITED CAPACITY INFORMATION PROCESSING SYSTEM IS
ADVOCATED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZHK13

AD-656 653 5/8 5/5 5/10
MICHIGAN UNIV ANN ARBOR DEPT OF PSYCHOLOGY

RECENT PSYCHOLOGICAL RESEARCH RELEVANT TO THE HUMAN
FACTORS ENGINEERING OF MAN-MACHINE SYSTEMS, (U)

65 7P PEW, RICHARD W. ;
CONTRACT: AF 49(638)-1235
PROJ: AF-929F-5002
MONITOR: AFOSR 67-1824

UNCLASSIFIED REPORT
AVAILABILITY: PUBLISHED IN PROCEEDINGS OF THE
NATIONAL ELECTRONICS CONFERENCE 5P OCT 1965.

DESCRIPTORS: (•MAN MACHINE SYSTEMS, •HUMAN FACTORS
ENGINEERING), DESIGN, SYSTEMS ENGINEERING,
MEMORY(PSYCHOLOGY), PSYCHOLOGY, BIONICS, DATA
PROCESSING, DECISION MAKING (U)

THE EMPHASIS OF THE REPORT WAS TO SURVEY A BODY OF
PSYCHOLOGICAL THEORY AND TO ILLUSTRATE A SPECIFIC
AREA IN WHICH THE THEORY AND ASSOCIATED EMPIRICAL
DATA ARE RELEVANT TO SYSTEM DESIGN PROBLEMS.
WITHIN THE FRAMEWORK DESCRIBING MAN AS A SINGLE-
CHANNEL INFORMATION PROCESSOR AT LEAST, THERE ARE
OTHER EQUALLY RELEVANT BODIES OF DATA. FOR
EXAMPLE, RESEARCH ON THE FUNCTIONAL CHARACTERISTICS
OF THE MEMORY SUBSYSTEM, ESPECIALLY SHORT-TERM MEMORY
ARE AVAILABLE TO ALLOW RELATIVELY PRECISE
SPECIFICATIONS OF TOLERABLE MEMORY LOAD, GIVEN THE
NATURE OF THE MATERIAL TO BE REMEMBERED. THIS
LITERATURE WOULD ALSO SUGGEST INFORMATION FORMAT AND
CODING FOR OPTIMUM RECALL OR RETREVAL. SIMILARLY,
THE ACCUMULATING BODY OF DATA FOCUSED ON ENGINEERING
DESCRIPTIONS OF MAN AS A CONTROLLER IN FEEDBACK
SYSTEMS ARE AVAILABLE FOR THOSE WITH PROBLEMS IN THIS
AREA. IN SHORT IT IS THE CONTENTION OF THE PAPER
THAT ONE SHOULD NOT RETREAT TO THE COMFORT OF HIS
ARMCHAIR AND ITS ASSOCIATED INTUITIVE DESIGN
TECHNIQUES WITHOUT FIRST MAKING A CONSCIENTIOUS
EFFORT TO TALK TO PSYCHOLOGISTS ABOUT HIS PARTICULAR
DESIGN PROBLEM AND TO SEEK OUT THE APPLICABLE
LITERATURE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-656 701 5/5 5/10 5/9 9/2
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

ADVANCES IN THE USE OF COMPUTERS FOR HANDLING HUMAN
FACTORS [AS: DATA, (U)

APR 67 16P STEED, LAWRENCE E. ;
REPT. NO. AMRL-TR-67-16
PROJ: AF-1710
TASK: 171006

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUBL. IN INTERNATIONAL SIMULATION
AND TRAINING CONFERENCE (3RD), NEW YORK, 24-27
APRIL 1967. SUPPORTED BY NASA AND CONTRACT
F33615-67-C-1036 WITH THE SYSTEM DEVELOPMENT CORP.

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, *DATA
PROCESSING); (*JOB ANALYSIS; HUMAN FACTORS ENGINEERING);
SYSTEMS ENGINEERING, TRAINING, COMPUTERS, ANALYSIS,
DATA, PERSONNEL MANAGEMENT (U)

THE PURPOSE OF THE PAPER IS TO REVIEW SOME OF THE
DATA PROBLEMS THE ANALYST MUST DEAL WITH IN HIS WORK
AND TO SUGGEST SOME POSSIBLE REMEDIES. A REVIEW OF
THE TASK ANALYSIS PROCEDURES IS FOLLOWED BY A
DISCUSSION OF THE USES OF TASK ANALYSIS IN SYSTEM
DEVELOPMENT PROGRAMS. PROBLEMS CONNECTED WITH EACH
WELL USED TO GENERATE THE GOALS OF A RESEARCH
PROGRAM, WHICH IS DIRECTED TOWARD THE DEVELOPMENT OF
COMPUTERIZED TECHNIQUES TO ASSIST THE ANALYST MAKE
BETTER USE OF AVAILABLE DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-658 754 1/3 5/8 5/5
LITTON SYSTEMS INC WOODLAND HILLS CALIF GUIDANCE AND
CONTROL SYSTEMS DIV

INTEGRATED COCKPIT RESEARCH PROGRAM. APPENDIX
II.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 67 93P MURPHY, JOHN V. ;PIZZICARA,
DONALD J. ;BELCHER, JAMES J. ;HAMSON, ROBERT
L. ;BERNBERY, RAYMOND E. ;
CONTRACT: NONR-4951(00)
PROJ: NR-213-041

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-658 753.

DESCRIPTORS: (*COCKPITS, SYSTEMS ENGINEERING), COST
EFFECTIVENESS, HUMAN FACTORS ENGINEERING, DISPLAY
SYSTEMS, PILOTS, AUTOMATIC, DATA PROCESSING, CONTROL,
SPECIFICATIONS

(U)

THE INTEGRATED COCKPIT RESEARCH PROGRAM WAS
DESIGNED TO DEVELOP A METHODOLOGY FOR AVIONIC SYSTEM
DESIGN APPLICATION TO AIRCRAFT IN AN ADVANCED TIME
PERIOD. EMPHASIS WAS PLACED ON TWO MAJOR
ACTIVITIES. ONE WAS CONCERNED WITH IDENTIFYING THE
REQUIREMENTS FOR THE OPERATOR/AVIONIC SYSTEM IN THE
FUTURE TIME PERIOD, AND A SECOND ACTIVITY WAS
CONCERNED WITH IDENTIFYING THE TECHNOLOGICAL STATE-
OF-THE-ART THAT WOULD BE AVAILABLE IN THE ADVANCED
TIME PERIOD TO MEET THOSE REQUIREMENTS. SUCCESSIVE
ASPECTS OF THE STUDY WERE CONCERNED WITH SYNTHESIZING
AN AVIONIC SYSTEM, COMPLETING A COST EFFECTIVENESS
EVALUATION, AND THE PREPARATION OF A COCKPIT MOCKUP.
APPENDIX II CONTAINS THE DATA PROCESSING ANALYSIS
WITH BLOCK DIAGRAMS OF THE MAJOR FUNCTIONAL AREAS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-659 307 8/2 9/2
UNITED AIRCRAFT CORPORATE SYSTEMS CENTER FARMINGTON
CONN

GRAPHIC DATA HANDLING TECHNIQUES. (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. JUN 66-JUN 67,
JUN 67 233P WILLIAMS, CLIFFORD W. ;
REPT. NO. SCR-351
CONTRACT: DA-44-009-AMC-1831(X)

UNCLASSIFIED REPORT

DESCRIPTORS: (*GRAPHICS, DATA PROCESSING), (*MAPPING,
DISPLAY SYSTEMS), (*MAN MACHINE SYSTEMS, GRAPHICS),
CATHODE RAY TUBE SCREENS, INPUT OUTPUT DEVICES, FLOW
CHARTING, COMPUTER PROGRAMS, HUMAN FACTORS ENGINEERING,
DIGITAL COMPUTERS, AUTOMATION, MAPS (U)
IDENTIFIERS: COMPUTER AIDED GRAPHICS, LIGHT PENS, ON-
LINE SYSTEMS (U)

TECHNIQUES AND EQUIPMENT FOR HANDLING GRAPHIC DATA
WERE THE SUBJECTS OF THE STUDY. THE GRAPHIC DATA
WERE DERIVED FROM LINE MAPS, COLOR SEPARATION SHEETS,
ORTHOPHOTOGRAPHS AND CONTOUR SHEETS. EQUIPMENT WAS
TESTED, WHEREVER FEASIBLE, BY IMPLEMENTING HARDWARE
AND SOFTWARE TO ENABLE THE ON-LINE COMMUNICATION
BETWEEN A HUMAN OPERATOR AND A DIGITAL COMPUTER.
THE HUMAN FACTORS OF HANDLING CARTOGRAPHIC DATA
WITH A CATHODE RAY TUBE DISPLAY EQUIPPED WITH A LIGHT
PEN WERE STUDIED TO A DEGREE SUFFICIENT TO OBTAIN
SPECIFIC CONCLUSIONS. AN OPERATIONAL TEST SYSTEM
WAS USED TO OBTAIN RESULTS OF TESTS AND TO
EXTRAPOLATE THE DATA OBTAINED FROM THESE TESTS INTO
POSSIBLE SYSTEM AND EQUIPMENT CONFIGURATIONS. THE
TEST SYSTEM CONSISTED OF A COMPUTATIONAL COMPLEX
EQUIPPED WITH A GRAPHICAL DISPLAY WITH PROVISION FOR
HUMAN INTERFACE AND AUGMENTED BY A BREADBOARD
SCANNER-DIGITIZER. THE OUTPUT OF THE SYSTEM
CONSISTS OF AN X-Y PLOTTER CAPABLE OF TRANSLATING
DIGITAL DATA INTO HARD COPY. ALTHOUGH THE TESTS
EMPHASIZED THE HUMAN INTERFACE WITH A COMPUTATIONAL
COMPLEX, THE TYPES OF GRAPHICAL DATA TO BE PROCESSED,
THE SOURCES OF THIS DATA, METHODS OF HANDLING DATA,
AND SUGGESTIONS FOR SOLVING THE FILE CONVERSION
PROCESS WERE ALSO INVESTIGATED. THESE
INVESTIGATIONS ARE DIRECTLY RELATED TO THE GRAPHICAL
DATA HANDLING TECHNIQUES BECAUSE IT HAS BEEN
DETERMINED THAT ANY GIVEN TECHNIQUE OR EQUIPMENT WILL
HAVE MANY USES IN THE TOTAL CARTOGRAPHIC SYSTEM.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-663 209 5/5 9/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

IMPLEMENTATION OF COMPUTER SOFTWARE TECHNIQUES TO
HUMAN FACTORS TASK DATA HANDLING PROBLEMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 21 JUN 66-30 JUN 67,
SEP 67 102P TULLEY, A. T. MEYER, G.

R. :

CONTRACT: F33615-67-C-1036
PROJ: AF-1710
TASK: 171006
MONITOR: AMRL TR-67-127

UNCLASSIFIED REPORT

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, *DATA
PROCESSING), COMPUTERS, INFORMATION RETRIEVAL, DATA
STORAGE SYSTEMS, SYSTEMS ENGINEERING (U)

RESEARCH LEADING TO THE IMPLEMENTATION OF COMPUTER
SOFTWARE TECHNIQUES FOR HANDLING HUMAN FACTORS TASK
DATA GENERATED IN SUPPORT OF AEROSPACE SYSTEM
DEVELOPMENT PROGRAMS IS DISCUSSED. TECHNIQUES
BEING EXPLORED IN THIS RESEARCH PROGRAM ARE BASED ON
THE ASSUMPTION THAT A USER-ORIENTED COMPUTERIZED DATA
SYSTEM WILL HELP DRAW HUMAN FACTORS SPECIALISTS
CLOSER TO NEEDED DATA. THE APPLICATION OF SUCH A
SYSTEM WILL REDUCE THE PROBLEM OF DATA ACCESSIBILITY
AND ALLOW MORE EFFECTIVE USE OF DATA IN THE SYSTEM
ENGINEERING PROCESS. PRELIMINARY RESEARCH LEADING
TO PROPOSED DATA HANDLING TECHNIQUES IS DISCUSSED.
A COMPUTERIZED DATA HANDLING SYSTEM TO STORE,
RETRIEVE, AND PROCESS HUMAN FACTORS TASK DATA IS
INITIALLY IMPLEMENTED THROUGH A PILOT STUDY. A
DISCUSSION OF THE PILOT STUDY SPECIFICATION IS
FOLLOWED BY A PRESENTATION OF THE DESIGN
SPECIFICATION FOR A COMPUTERIZED EXPERIMENTAL SYSTEM.
THE EXPERIMENTAL SYSTEM, REFERRED TO AS THE PILOT
STUDY EXPERIMENTAL SYSTEM, PROVIDES THE PRIMARY MEANS
FOR DEMONSTRATING AND EVALUATING THE RESEARCH RESULTS
AGAINST THE ORIGINAL RESEARCH GOALS. COMPUTER
SOFTWARE DESCRIPTIONS ARE PRESENTED FOR IMPLEMENTING
THE PILOT STUDY EXPERIMENTAL SYSTEM IN A USER-
ORIENTED ENVIRONMENT IN TERMS OF INFORMATION NEEDS OF
HUMAN FACTORS SPECIALISTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-664 137 19/5
FRANKFORD ARSENAL PHILADELPHIA PA FIRE CONTROL
DEVELOPMENT AND ENGINEERING LABS

COMPUTER, GUN DIRECTION M18 (FADAC) APPLICATIONS
MANUAL. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
MAY 67 135P PRICE, THOMAS J. ;
MONITOR: FA TN-1119

UNCLASSIFIED REPORT

DESCRIPTORS: (*FIRE CONTROL COMPUTERS, *INSTRUCTION
MANUALS), DIGITAL COMPUTERS, INTEGRATED SYSTEMS,
INTERFACES, SYSTEMS ENGINEERING, WEAPON SYSTEMS,
ARTILLERY FIRE, INPUT OUTPUT DEVICES, AUTOMATIC, MEMORY
DEVICES, COMPUTERS, CALIBRATION, TEST EQUIPMENT, CONTROL
PANELS, HUMAN FACTORS ENGINEERING (U)
IDENTIFIERS: FADAC(FIELD ARTILLERY DIGITAL AUTOMATIC
COMPUTER), M-18 COMPUTERS (U)

THE FADAC APPLICATIONS MANUAL IS A SUMMARY
DOCUMENT WHICH PROVIDES INFORMATION REQUIRED BY
SYSTEM ENGINEERS FOR INTEGRATING THE M18 (FADAC)
WITH PERIPHERAL DEVICES AND EQUIPMENT. BRIEF
INTRODUCTORY DESCRIPTIONS OF THE M18
CHARACTERISTICS AND COMMAND STRUCTURE ARE PROVIDED;
WHEREAS THE INPUT-OUTPUT CAPABILITIES ARE DISCUSSED
IN DETAIL AND RELATED LOGIC TERMS ARE FULLY DEFINED.
DESCRIPTIONS OF INTERFACING WITH REPRESENTATIVE
INPUT-OUTPUT DEVICES ARE PROVIDED TO INDICATE THE
M18 INPUT-OUTPUT OPERATIONS. A BRIEF DISCUSSION
OF SYSTEM DEVELOPMENT PROGRAMS THAT UTILIZE THE M18
ARE ALSO PROVIDED, AS EXAMPLES, TO FURTHER DELINEATE
THE INHERENT INPUT-OUTPUT FLEXIBILITY OF THE M18
FOR SYSTEMS INTEGRATION. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-665 469 5/5
OHIO STATE UNIV COLUMBUS HUMAN PERFORMANCE CENTER

SOME PRINCIPLES FOR THE DESIGN OF DECISION SYSTEMS:
A REVIEW OF SIX YEARS OF RESEARCH ON A COMMAND-
CONTROL SYSTEM SIMULATION. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 APR 60-31 AUG 66,
SEP 67 42P HOWELL, WILLIAM C. ;
CONTRACT: AF 33(615)-2248
PROJ: AF-7184
TASK: 718403
MONITOR: AMRL TR-67-136

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN FACTORS ENGINEERING, COMMAND AND
CONTROL SYSTEMS), SIMULATION, DECISION MAKING,
MATHEMATICAL PREDICTION, MAN MACHINE SYSTEMS,
AUTOMATION, PERFORMANCE(HUMAN), STRESS(PSYCHOLOGY) (U)
IDENTIFIERS: BAYES THEOREM (U)

A SET OF GENERAL PRINCIPLES FOR GUIDANCE IN
DECISION SYSTEM DEVELOPMENT IS PRESENTED BASED UPON
RESEARCH FINDINGS OBTAINED IN A SIMULATED (BUT
HIGHLY GENERALIZED) COMMAND-CONTROL SYSTEM. THE
CHIEF OBJECTIVE OF THE RESEARCH WAS EVALUATION OF AN
AUTOMATED PROCEDURE FOR ASSISTING MAN IN MAKING
DIAGNOSTIC DECISIONS. BRIEFLY, THIS PROCEDURE
INVOLVED AGGREGATION BY THE MACHINE OF HUMAN
EVALUATIONS OF A NUMBER OF SEPARATE ITEMS OF
RECONNAISSANCE DATA. COMPARISONS WERE MADE BETWEEN
PERFORMANCE OF THE SYSTEM IN ASSESSING ENVIRONMENTAL
STATES (E.G., ENEMY STRATEGIES) WHEN THE
AUTOMATED PROCEDURE WAS AND WAS NOT IN EFFECT UNDER A
VARIETY OF TASK CIRCUMSTANCES (E.G., LOAD, LEVEL OF
INFORMATION FIDELITY, FEEDBACK, ETC.). THE 13
PRINCIPLES THUS FORMULATED GENERALLY SUPPORT THE USE
OF AN AUTOMATED AGGREGATION PROCEDURE IN DIAGNOSIS.
FURTHERMORE, THEY SHOW THAT MACHINE AGGREGATION IS
MOST BENEFICIAL IN CIRCUMSTANCES WHICH PRODUCE LARGE
AMOUNTS OF LOW-QUALITY DATA OR THOSE IN WHICH THE
HUMAN IS PLACED UNDER SOME SORT OF STRESS. SEVERAL
OF THE PRINCIPLES SUGGEST POSSIBLE LIMITATIONS ON THE
USE OF MACHINES IN DECISION MAKING. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-669 129 9/2 5/1
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

SYSTEM ENGINEERING GUIDE FOR COMPUTER PROGRAMS, (U)

MAR 68 174P SEARLE, LLOYD V. ; HENDERSON,
ROBERT L. ;
REPT. NO. TM-3596
CONTRACT: F19628-67-C-0148
PROJ: AFSC-2801, AFSC-6917
MONITOR: ESD TR-68-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES AD-666 430.

DESCRIPTORS: (*COMPUTER PROGRAMS, *SYSTEMS ENGINEERING),
HANDBOOKS, INSTRUCTION MANUALS, COMPUTER PROGRAMMING,
HUMAN FACTORS ENGINEERING, ELECTRONIC EQUIPMENT,
MANAGEMENT PLANNING AND CONTROL, MILITARY REQUIREMENTS,
FEASIBILITY STUDIES, DATA PROCESSING,
SEQUENCES(MATHEMATICS), MAN MACHINE SYSTEMS, CODING,
CHECKOUT PROCEDURES, MODIFICATION KITS, FLOW CHARTING,
SEQUENCES(MATHEMATICS), PACKAGING, INSTALLATION (U)

THIS REPORT DISCUSSES THE APPLICATION OF SYSTEM
ENGINEERING PRINCIPLES TO THE DEVELOPMENT OF COMPUTER
PROGRAMS AND ASSOCIATED ELEMENTS OF LARGE SYSTEMS.
USING THE 'ROAD MAP' APPROACH AND BASIC CONCEPTS
ESTABLISHED BY THE AIR FORCE, IT DESCRIBES STEP-
BY-STEP EVENTS DURING THE CONCEPTUAL, DEFINITION,
ACQUISITION, AND OPERATIONAL PHASES OF A SYSTEM LIFE
CYCLE. TECHNICAL MILESTONES IN SYSTEM COMPUTER
PROGRAM ANALYSIS, DESIGN AND DEVELOPMENTS ARE
IDENTIFIED AND RELATED TO ASSOCIATED ACTIVITIES AND
REQUIREMENTS IN THE AREAS OF TEST AND EVALUATION,
CONFIGURATION MANAGEMENT, DATA MANAGEMENT, AND HUMAN
FACTORS. PROCEDURES OUTLINED IN THE GUIDE ARE
BASED ON EXPERIENCE WITH A NUMBER OF LARGE ELECTRONIC
SYSTEMS DEVELOPED FOR THE AIR FORCE. EMPHASIS
IN THE DESCRIPTION IS PLACED ON ASPECTS OF THE
TECHNICAL PROCESS WHICH HAVE SIGNIFICANT IMPLICATIONS
FOR SYSTEM PROGRAM PLANNING AND MANAGEMENT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-670 604 5/5 5/8 9/2
BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

ON THE PSYCHOLOGICAL IMPORTANCE OF TIME IN A TIME
SHARING SYSTEM, (U)

SEP 67 30P CARBONELL, JAIME R. ; ELKIND,
JEROME I. ; INICKERSON, RAYMOND S. ;
REPT. NO. SCIENTIFIC-6, BBN-1667
CONTRACT: F19628-68-C-0125, ARPA ORDER-627
PROJ: AF-8668
MONITOR: AFCRL 68-0120

UNCLASSIFIED REPORT

DESCRIPTORS: (•TIME SHARING, ACCEPTABILITY), (•MAN
MACHINE SYSTEMS, TIME SHARING), INTERACTIONS, COSTS,
REACTION(PSYCHOLOGY), COMPUTERS, RESPONSE, HUMAN FACTORS
ENGINEERING, MATHEMATICAL ANALYSIS (U)

ONE OF THE MOST IMPORTANT PROBLEMS IN THE DESIGN
AND/OR OPERATION OF A COMPUTER UTILITY IS TO OBTAIN
DYNAMICAL CHARACTERISTICS THAT ARE ACCEPTABLE AND
CONVENIENT TO THE ON-LINE USER. THIS REPORT IS
CONCERNED WITH THE PROBLEMS OF ACCESS TO THE COMPUTER
UTILITY, RESPONSE TIME AND ITS EFFECT UPON
CONVERSATIONAL USE OF THE COMPUTER, AND THE EFFECTS
OF THE LOAD ON THE SYSTEM (AND ITS FLUCTUATIONS)
UPON THE OTHER ASPECTS. PRIMARY ATTENTION IS
PLACED UPON RESPONSE TIME. SOME OF THE
DIFFICULTIES IN ITS DEFINITION ARE POINTED OUT
THROUGH EXAMINATION OF THE TYPICAL INTERACTION
PROCESS. IT IS CONCLUDED THAT RATHER THAN A SINGLE
MEASURE A SET OF RESPONSE TIMES SHOULD BE MEASURED IN
A GIVEN COMPUTER UTILITY, IN CORRESPONDENCE TO THE
DIFFERENT TYPES OF OPERATIONS REQUESTED. NEXT, IT
IS TENTATIVELY ASSUMED THAT THE PSYCHOLOGICAL VALUE
OF SHORT RESPONSE TIMES STEMS FROM A SUBJECTIVE COST
MEASURE OF THE USER'S OWN TIME, LARGELY INFLUENCED BY
THE VALUE OF CONCURRENT TASKS BEING POSTPONED. A
MEASURE OF COST (TO THE INDIVIDUAL AND/OR HIS
ORGANIZATION) OF THE TIME-ON-LINE REQUIRED TO
PERFORM A TASK MIGHT THUS BE DERIVED. MORE SUBTLE
IS THE PROBLEM OF THE USER'S ACCEPTABILITY IS A
FUNCTION OF THE SERVICE REQUESTED (E.G., LENGTH OF
COMPUTATION), AND VARIABILITY WITH RESPECT TO
EXPECTATIONS DUE BOTH TO UNCERTAINTY IN THE USER'S
ESTIMATION AND TO VARIATIONS IN THE RESPONSE TIME
ORIGINATED BY VARIABLE LOADS ON THE SYSTEM.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-671 126 5/8 5/5
GEORGE WASHINGTON UNIV ALEXANDRIA VA HUMAN RESOURCES
RESEARCH OFFICE

A CONCEPT OF THE ROLE OF MAN IN AUTOMATED SYSTEMS, (U)

MAY 68 11P MELCHING, WILLIAM H. ;
REPT. NO. HUMRRO PROFESSIONAL PAPER-14-68
CONTRACT: DA-44-188-ARO-2
PROJ: DA-2J024701A712
TASK: 2J024701A712-01

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE SOUTHWESTERN
PSYCHOLOGICAL ASSOCIATION ANNUAL MEETING, NEW
ORLEANS, LA., APR 1968.

DESCRIPTORS: (*MAN MACHINE SYSTEMS, HUMAN FACTORS
ENGINEERING), (*HUMAN FACTORS ENGINEERING, *DECISION
MAKING), SYMPOSIA, NATIONAL DEFENSE, ANTIMISSILE DEFENSE
SYSTEMS, AUTOMATIC, COMPUTERS, SYSTEMS ENGINEERING,
FAILURE, SELECTION (U)

A PROBLEM THAT HAS LONG PLAGUED SYSTEM DESIGNERS
AND HUMAN FACTORS ENGINEERS IS THAT OF ALLOCATION OF
FUNCTIONS BETWEEN MAN AND MACHINE. THIS PAPER
REPORTS AN ATTEMPT TO ISOLATE AND IDENTIFY FACTORS
PERTINENT TO MAKING ALLOCATION DECISIONS. FROM AN
ANALYSIS OF THE FUNCTIONS AND MISSIONS OF SEVERAL
AUTOMATED SYSTEMS, SIX FACTORS WERE SHOWN TO BE
HIGHLY RELEVANT TO ALLOCATION DECISIONS. ONE
FACTOR, MAN'S ROLE IN AUTOMATED SYSTEMS, EMERGED AS A
VARIABLE OF PARTICULAR INTEREST. IN ADDITION, FOUR
CLASSES OF MANUAL FUNCTIONS COMMON TO ALL AUTOMATED
SYSTEMS WERE IDENTIFIED. IT WAS DETERMINED THAT
THESE CLASSES, IN TURN, CONSTITUTED A MEANINGFUL
DESCRIPTION OF THE ROLE OF MAN IN TODAY'S AUTOMATED
SYSTEMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-671 531 5/2 5/5 9/2
SYSTEM DEVELOPMENT CORP DAYTON OHIO

COMPUTERIZED HUMAN FACTORS TASK DATA HANDLING
TECHNIQUES, USER'S AND CONTROLLER'S OPERATING
GUIDES.

101

DESCRIPTIVE NOTE: FINAL REPT. 30 JUN-31 OCT 67,
MAR 68 148P REARDON, SUE E. ;
CONTRACT: F33615-67-C-1036
PROJ: AF-1710
TASK: 171006
MONITOR: AMRL TR-67-226

UNCLASSIFIED REPORT

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, INFORMATION
RETRIEVAL), (*INFORMATION RETRIEVAL, *DATA PROCESSING),
DATA STORAGE SYSTEMS, INSTRUCTION MANUALS, PERSONNEL,
PERFORMANCE(HUMAN), HAZARDS, ERRORS, TIME SHARING,
TELETYPE SYSTEMS, DIGITAL COMPUTERS (U)
IDENTIFIERS: AN/FSQ-32 (U)

INSTRUCTIONS ARE PRESENTED FOR THE OPERATION OF AN
EXPERIMENTAL COMPUTERIZED DATA HANDLING SYSTEM.
THESE INSTRUCTIONS WERE DEVELOPED AS PART OF THE
OVERALL RESEARCH INTO A USER-ORIENTED COMPUTERIZED
SYSTEM TO STORE, RETRIEVE, AND PROCESS HUMAN FACTORS
TASK DATA. THESE INSTRUCTIONS ARE INTENDED AS A
MODEL FOR FUTURE OPERATING GUIDES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-673 348 5/8 5/10 12/2 15/7
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB
OHIO

MATHEMATICAL MODELS OF HUMAN PERFORMANCE IN MAN-
MACHINE SYSTEMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. APR-DEC 67,
MAY 68 21P TOPMILLER, DONALD A. ;
REPT. NO. AMRL-TR-68-22
PROJ: AF-7184
TASK: 718403

UNCLASSIFIED REPORT

DESCRIPTORS: (*MAN MACHINE SYSTEMS, MATHEMATICAL
MODELS), (*PERFORMANCE(HUMAN), *DECISION MAKING),
COMMAND AND CONTROL SYSTEMS, THREAT EVALUATION, WAR
GAMES, MAINTENANCE, SIMULATION, FACTOR ANALYSIS,
REGRESSION ANALYSIS, AUTOMATION, REAL TIME
IDENTIFIERS: COMPUTERS

(U)

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THE REPORT DESCRIBES THREE RESEARCH APPROACHES TO
THE PROBLEM OF MATHEMATICALLY REPRESENTING HUMAN
PERFORMANCE PARAMETERS IN WEAPON, MAINTENANCE, AND
COMMAND AND CONTROL SYSTEMS. IN THE FIRST
APPROACH, TWENTY OPERATIONS RESEARCH ANALYSES AND
MODELS OF MILITARY SYSTEMS WERE EXAMINED TO DETERMINE
IF THE MODELS INCLUDED HUMAN FACTORS PARAMETERS AND
TO WHAT EXTENT THEY WERE SENSITIVE TO VARIATIONS IN
THESE PARAMETERS. ALTHOUGH MANY OF THE FUNCTIONS
OF THE SYSTEMS MODELED WERE PERFORMED BY HUMANS,
HUMAN PERFORMANCE PARAMETERS WERE NOT, IN GENERAL,
SUFFICIENTLY DEFINED TO PERMIT MATHEMATICAL OR
EMPIRICAL MANIPULATION WITHIN A MAN-MACHINE
SIMULATION FRAMEWORK. IN THE SECOND APPROACH, AN
ATTEMPT WAS MADE TO ESTABLISH PREDICTIVE
RELATIONSHIPS, BASED ON REGRESSION AND FACTOR
ANALYSIS TECHNIQUES, BETWEEN HUMAN ENGINEERING DESIGN
PARAMETERS AND THOSE CRITERIA OF SYSTEMS
EFFECTIVENESS, SUCH AS MAINTENANCE TASK TIME, THAT
CAN BE TRANSFORMED INTO A MORE HOLAR INDEX--SYSTEM
DOWNTIME. THE HUMAN ENGINEERING PREDICTOR-
PARAMETERS ACCOUNTED FOR 50% OF THE CRITERION
VARIANCE. IN THE THIRD APPROACH, A SERIES OF
EXPERIMENTS INVOLVING REAL-TIME SIMULATION OF A
COMMAND AND CONTROL SYSTEM WAS CONDUCTED TO DETERMINE
IF, AND HOW, A COMPUTER MIGHT AID DIAGNOSTIC
PERFORMANCE (IN TACTICAL DECISION MAKING) IN
THREAT EVALUATIONS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-674 696 5/8 6/4
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

MAN AND TECHNOLOGY,

(U)

OCT 67 75P ZINCHENKO, V. P. ; SMOLYAN,
G. L. ;
REPT. NO. FTD-MT-24-328-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF MONO.
CHELOVEK I TEKHNIKA, SISTEMY UPRAVLENIYA I
INZHENERNAYA PSIKHOLOGIYA, MOSCOW, 1965 P3-48.

DESCRIPTORS: (•MAN MACHINE SYSTEMS, •CYBERNETICS),
BIONICS, NERVOUS SYSTEM, VISUAL PERCEPTION, HUMAN
FACTORS ENGINEERING, CONTROL SYSTEMS, AUTOMATIC,
PERFORMANCE(HUMAN), COMPUTERS, MODELS(SIMULATIONS),
DECISION MAKING, USSR

(U)

IDENTIFIERS: TRANSLATIONS

(U)

CONTENTS: PROBLEM OF THE CYBERNETIC CENTURY;
HUMAN FACTORS AND OPERATOR ACTIVITY; PERCEPTION -
- DECISION ACTION; IN THE LANGUAGE OF MODELS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-677 368 5/5 5/2
TUFTS UNIV MEDFORD MASS INST FOR PSYCHOLOGICAL
RESEARCH

HUMAN FACTORS ENGINEERING BIBLIOGRAPHIC SERIES.
VOLUME 4, 1966 LITERATURE, (U)

DEC 67 623P RONCO, PAUL G. ;
CONTRACT: DA-18-001-AMC-1004(X)
MONITOR: HEL BIB-VOL-4

UNCLASSIFIED REPORT

DESCRIPTORS: (•HUMAN FACTORS ENGINEERING,
BIBLIOGRAPHIES), ACOUSTICS, AIRCRAFT, AUTOMATION,
CLOTHING, COMMUNICATION SYSTEMS, CONTROL SYSTEMS, DRUGS,
DISPLAY SYSTEMS, ILLUMINATION, MARINE ENGINEERING,
MAINTENANCE, NOISE, PHYSIOLOGY, SAFETY, SIGNALS, SPACE
NAVIGATION, TRAINING, TRANSPORTATION, HANDBOOKS,
DETECTION, ENVIRONMENT, SIMULATION (U)

THIS BIBLIOGRAPHY IS THE FOURTH IN A PLANNED SERIES
OF BIBLIOGRAPHIES OF LITERATURE PERTINENT TO THE
FIELD OF HUMAN FACTORS ENGINEERING. IT COVERS
LITERATURE OF 1966. THIS BIBLIOGRAPHY CONSISTS
PRIMARILY OF: (1) AN INDEX TO THE HUMAN
FACTORS LITERATURE, AND (2) THE ANNOTATED
BIBLIOGRAPHY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-682 362 5/5 5/2 9/2
SYSTEM DEVELOPMENT CORP DAYTON OHIO

DEVELOPMENT AND APPLICATION OF COMPUTER SOFTWARE
TECHNIQUES TO HUMAN FACTORS TASK DATA HANDLING
PROBLEMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT., 1 JUL 67-27 SEP 68,
NOV 68 192P TULLEY, ALBERT T. MEYER,
GEORGE R. COLLIER, ROBERT G. MITCHELL, PHYLLIS
J. REARDON, SUE E. ;
CONTRACT: F33615-67-C-1036
PROJ: AF-1710
TASK: 171006
MONITOR: AFHRL TR-68-13

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN FACTORS ENGINEERING, INFORMATION
RETRIEVAL), COMPUTER PROGRAMMING, DATA PROCESSING, JOB
ANALYSIS, CLASSIFICATION, VOCABULARY, FEASIBILITY
STUDIES

(U)

RESEARCH LEADING TO THE APPLICATION AND
IMPLEMENTATION OF TECHNIQUES FOR COMPUTER HANDLING OF
HUMAN FACTORS TASK DATA GENERATED IN SUPPORT OF
AEROSPACE SYSTEM DEVELOPMENT PROGRAMS IS DISCUSSED.
THE TECHNIQUE DEVELOPMENT IS BASED ON THE
ASSUMPTION THAT A USER-ORIENTED COMPUTERIZED DATA
HANDLING SYSTEM WILL HELP DRAW HUMAN FACTORS
SPECIALISTS CLOSER TO NEEDED DATA. THE APPLICATION
OF THESE TECHNIQUES SHOULD REDUCE THE PROBLEM OF DATA
ACCESSIBILITY AND ALLOW MORE EFFECTIVE USE OF DATA IN
THE SYSTEM DESIGN AND DEVELOPMENT PROCESS. A
COMPUTERIZED DATA HANDLING SYSTEM TO STORE,
SELECTIVELY RETRIEVE, AND PROCESS HUMAN FACTORS DATA
IN A USER-ORIENTED ENVIRONMENT WAS IMPLEMENTED
THROUGH A PILOT STUDY EXPERIMENTAL SYSTEM
(PSES). THIS EXPERIMENTAL SYSTEM PROVIDED THE
PRIMARY MEANS FOR EVALUATING THE RESEARCH RESULTS.
THIS REPORT DISCUSSES THE DEVELOPMENT PROCESS OF
THE PSES, THE COMPUTER SOFTWARE USED BY THE PSES,
DATA CLASSIFICATION TECHNIQUES, AND VOCABULARY
CONTROLS. CONSIDERATION IS ALSO GIVEN TO THE
FEASIBILITY OF PROVIDING (1) ANALYTIC AND
SIMULATION TOOLS IN A USER-ORIENTED ENVIRONMENT,
(2) CURRENT AWARENESS NOTIFICATION OF DATA
ENTRIES, AND (3) AN ADVANCED AND SOPHISTICATED
CLASSIFICATION SCHEME FOR IDENTIFYING FUNCTIONAL
RELATIONSHIPS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-684 548 5/5
OHIO STATE UNIV COLUMBUS HUMAN PERFORMANCE CENTER

SOME PRINCIPLES FOR DESIGN OF DECISION SYSTEMS: A
REVIEW OF THE FINAL PHASE OF RESEARCH ON A COMMAND-
CONTROL SYSTEM SIMULATION. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 SEP 66-31 MAR 68,
NOV 68 54P HOWELL, WILLIAM C. ; GETTYS,
CHARLES F. ;
CONTRACT: AF 33(615)-2248
PROJ: AF-7184
TASK: 718403
MONITOR: AMRL TR-68-158

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN FACTORS ENGINEERING, COMMAND AND
CONTROL SYSTEMS), DECISION MAKING, SIMULATION, MAN
MACHINE SYSTEMS, AUTOMATION, PROBABILITY, MATHEMATICAL
PREDICTION (U)
IDENTIFIERS: BAYES THEOREM (U)

THE CHIEF OBJECTIVE OF THE PRESENT RESEARCH WAS TO
ANTICIPATE A NUMBER OF ISSUES WHICH WOULD ARISE IF AN
AUTOMATED AID TO DECISION MAKING WERE ACTUALLY
IMPLEMENTED. QUESTIONS ASKED INCLUDED: (1)
WHAT HAPPENS TO SYSTEM PERFORMANCE IF PROBABILISTIC
INFORMATION IS REDUCED TO AN ALL-OR-NONE FORM AT SOME
POINT IN PROCESSING. (2) CAN A HIERARCHICAL
(SPECIALIST-NONSPECIALIST) SYSTEM USE LIMITED
RESOURCES EFFECTIVELY TO GATHER PREDICTIVE DATA.
(3) CAN A SYSTEM IN WHICH AGGREGATION OF
PREDICTIVE INFORMATION IS AUTOMATED BENEFIT FROM A
MANUAL SUPPLEMENT (TO HANDLE UNANTICIPATED DATA).
RESULTS SUMMARIZED IN THE NINE PRINCIPLES SUGGEST
THAT (1) ALL-NONE TRANSFORMATION OF PROBABILISTIC
DATA CAN SERIOUSLY DEGRADE SYSTEM PERFORMANCE,
ESPECIALLY IF SYSTEM RESPONSE IS IN ANY WAY DEPENDENT
UPON LIKELIHOOD OF ALTERNATIVE STATES (BUT THERE
ARE SEVERAL IMPORTANT EXCEPTIONS TO THIS RULE);
(2) POTENTIAL DEFICIENCIES IN ALLOCATION OF
RESOURCES BY THE SYSTEM SHOULD BE GUARDED AGAINST IN
FUTURE SYSTEM DESIGNS; (3) AN AUTOMATED
AGGREGATION DESIGN CAN BE ENHANCED BY A MANUAL
SUPPLEMENT TO DEAL WITH UNANTICIPATED DATA; (4) A
VOICE COMMUNICATION CAPABILITY DOES NOT OFFSET SYSTEM
PERFORMANCE DEFICIT ATTRIBUTABLE TO DEGRADATION OF
OTHER PROCESSING MODES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-687 488 5/9 5/5 6/2
LOCKHEED MISSILES AND SPACE CO SUNNYVALE CALIF
BIOTECHNOLOGY

HUMAN FACTORS AND BIOTECHNOLOGY - A STATUS SURVEY
FOR 1968-69.

(U)

DESCRIPTIVE NOTE: FINAL REPT. MAY 68-MAY 69,
APR 69 422P KRAFT, JACK A. ;
REPT. NO. LMSC-687154
CONTRACT: N00014-68-C-0378
PROJ: NR-196-079

UNCLASSIFIED REPORT

DESCRIPTORS: (•HUMAN FACTORS ENGINEERING, REVIEWS),
(•PERSONNEL MANAGEMENT, BIOLOGY), PERSONNEL, SALARIES,
ORGANIZATIONS, EFFECTIVENESS, EDUCATION, COMPUTERS,
INDUSTRIAL RESEARCH

(U)

IDENTIFIERS: BIOENGINEERING

(U)

THE REPORT DEALS WITH THE FINDINGS OF A SURVEY OF
OVER 500 HUMAN FACTORS AND BIOTECHNOLOGY PROGRAMS IN
U.S.A. BUSINESS AND INDUSTRY, CONSULTING,
GOVERNMENT, NON-PROFIT RESEARCH AND EDUCATIONAL
ORGANIZATIONS. THE SURVEY GATHERED INFORMATION
RELATIVE TO: SIZE OF HUMAN FACTORS AND
BIOTECHNOLOGY (HF-BIO) ORGANIZATIONS; GROWTH OF
THE PROFESSION, TURNOVER RATES, REPORTING LEVELS,
GROUP COMPOSITION, QUALIFICATIONS FOR HF-BIO
PEOPLE, ACADEMIC DEGREES, HIRING SOURCES, HIRING
METHODS, SALARIES, SOURCES OF PROGRAM SUPPORT,
ACTIVITIES, FACILITIES, COMPUTER USAGE, PUBLICATIONS,
PRESENTATIONS, PROFESSIONAL SOCIETY MEMBERSHIP, AND
MEETING ATTENDANCE, FILMS, WORK AIDS AND DEVICES,
PROFESSIONAL DEVELOPMENT, PROJECTED GROWTH OF FIELD,
HF-BIO EDUCATIONAL PROGRAMS, DEGREES OFFERED,
APPRENTICESHIPS, NUMBER OF STUDENTS TRAINED, PROBLEMS
ASSOCIATED WITH THE HF-BIO FIELD, MEANS FOR
INCREASING THE EFFECTIVENESS OF THE PROFESSION AND
TRENDS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-688 581 15/4 9/2 9/1
HRB-SINGER INC STATE COLLEGE PA

(IMPLICATIONS OF BESRL RESEARCH FOR DISPLAYS IN
TACTICAL INFORMATION PROCESSING.

(U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH REPT.,
JAN 69 34P MCKENDRY, JAMES M. IMAGE,
DOUGLAS J. BAKER, JAMES D. ;
CONTRACT: DAHC19-68-C-0006
PROJ: DA-2-0-062106-A-723
MONITOR: BESRL TRR-1156

UNCLASSIFIED REPORT

DESCR: (TACTICAL WARFARE, DISPLAY SYSTEMS),
(DISPLAY PROCESSING, HUMAN FACTORS ENGINEERING), MILITARY
OPERATIONS, DEPLOYMENT, TIME, VOLUME, MILITARY
INTELLIGENCE, INPUT OUTPUT DEVICES, FEASIBILITY STUDIES,
CATHODE RAY TUBE SCREENS, MAPPING, AUTOMATION, DECISION
MAKING, PERFORMANCE (HUMAN), PREDICTIONS (U)
IDENTIFIERS: TOS (TACTICAL OPERATIONS SYSTEMS) (U)

THE PURPOSE OF THE REPORT IS TWO-FOLD: FIRST, TO
EXAMINE THE POTENTIAL IMPACT OF PAST AND ON-GOING
HUMAN PERFORMANCE RESEARCH ON OPERATIONAL PROBLEMS IN
ASSIMILATING INFORMATION FROM SITUATION DISPLAYS IN
THE FIELD; SECOND, TO IDENTIFY OPERATIONAL PROBLEM
AREAS INVOLVING PREPARATION AND USE OF SITUATION
DISPLAYS WHICH COULD PROFIT FROM DETAILED HUMAN
PERFORMANCE RESEARCH. DURING FIELD OPERATIONS,
MILITARY STAFF OFFICERS MAINTAIN A REPRESENTATION OF
THE TACTICAL SITUATION OF BOTH FRIENDLY AND ENEMY
FORCES. THE STAFF ELEMENT PRIMARILY CONCERNED WITH
THE FRIENDLY FORCE SITUATION IS THE OPERATIONS
ELEMENT (G3); THE INTELLIGENCE ELEMENT (G2)
FOCUSES ON THE ENEMY SITUATION. WITH THE STAFFS OF
BOTH ELEMENTS, ASSIMILATION OF INFORMATION FROM
SITUATION DISPLAYS IS AN IMPORTANT PART OF THE JOB.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZHK13

AD-689 365 5/2 9/2
GEORGE WASHINGTON UNIV WASHINGTON D C LOGISTICS RESEARCH
PROJECT

DATA INPUT ERROR DETECTION AND CORRECTION
PROCEDURES,

(U)

JUN 69 246P VARLEY, THOMAS C. ;
REPT. NO. SERIAL-T-222
CONTRACT: N00014-67-A-0214-0001
PROJ: NR-047-G01

UNCLASSIFIED REPORT

DESCRIPTORS: (*INFORMATION RETRIEVAL, ACCURACY), ERRORS,
DETECTION, CORRECTIONS, HUMAN FACTORS ENGINEERING,
MANAGEMENT PLANNING AND CONTROL, DATA PROCESSING,
AUTOMATION, COLLECTING METHODS, INFORMATION THEORY,
CLASSIFICATION, DECISION MAKING, COSTS, RELIABILITY,
COMPUTERS, COMPUTER PERSONNEL, INPUT OUTPUT DEVICES,
PUNCHED CARDS, READING MACHINES, THESES (U)
IDENTIFIERS: DECISION MAKING, MODELS, *INFORMATION
SYSTEMS (U)

THE STUDY IS AN EXAMINATION OF THE INPUT DATA ERROR
PROBLEM IN COMPUTERIZED INFORMATION SYSTEMS. THE
AREA OF CONCERN IS THE DETECTION AND CORRECTION OF
INPUT DATA ERRORS RESULTING FROM HUMAN RECORDING
DURING THE INITIAL COLLECTION OF THE DATA. THIS
RESEARCH ATTEMPTS TO REMOVE SOME OF THE MYSTERY
SURROUNDING THE INPUT ERROR PROBLEM. A SYSTEM FOR
CLASSIFYING ERRORS BY TYPE IS DEVELOPED; ATTENTION IS
PAID TO THE KINDS OF ERRORS WHICH CAN BE MADE OR
INTRODUCED AT VARIOUS LEVELS IN THE DATA GENERATION-
DATA PROCESSING CHAIN. MORE IMPORTANT, THESE
LEVELS AND THEIR POTENTIAL USE TO MANAGERS AND
RESEARCHERS ALIKE PROVIDE A CONCEPTUAL FRAMEWORK IN
WHICH INTELLIGENT DISCUSSIONS CONCERNING THE ERROR
PROCESS CAN BE FORMULATED. THE CONCEPT OF DATA
WORTH ALONE PROVIDES A SIGNIFICANT STEP FORWARD IN
BUILDING AN INTELLIGENT DETECTION AND CORRECTION
PROCESS. THE STUDY DEVELOPS A SYSTEMATIC
PROCEDURE--A MODEL--FOR EVALUATING THE VARIOUS
DETECTION AND CORRECTION ALTERNATIVES. THE FINAL
EVALUATION OF THE DETECTION AND CORRECTION PROCEDURES
TO BE USED IN THE SYSTEM IS BASED ON COST. THIS IS
NOT DISPLACEMENT COST, BUT COST ASSOCIATED WITH
IMPROVED OPERATIONS THROUGH MORE ACCURATE
INFORMATION. THE VALUE OF INFORMATION IS THE WORTH
OF THE DATA, AND THE WORTH OF THE DATA IS THE DATA
ACCURACY PROBLEM.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-694 347 5/10 9/2
ARMY BEHAVIORAL SCIENCE RESEARCH LAB ARLINGTON VA

HUMAN FACTORS RESEARCH IN COMMAND INFORMATION
PROCESSING SYSTEMS--SUMMARY OF RECENT STUDIES. (U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH REPT.,
JUL 69 27P RINGEL, SEYMOUR ; BAKER, JAMES
D. ; STRUB, MICHAEL H. ; KENSINGER, LOREN L. ;

REPT. NO. BESRL-TRK-1158
PROJ: DA-2-Q-024701-A-723

UNCLASSIFIED REPORT

DESCRIPTORS: (*MILITARY OPERATIONS, DATA PROCESSING),
(*DECISION MAKING, MAN MACHINE SYSTEMS), COMPUTER
PROGRAMMING, INFORMATION RETRIEVAL, PERFORMANCE(HUMAN),
PERFORMANCE(ENGINEERING), AUTOMATION, HUMAN FACTORS
ENGINEERING, OFFICER PERSONNEL, REVIEWS, CATHODE RAY
TUBES, TYPEWRITERS, TELETYPE SYSTEMS, DATA STORAGE
SYSTEMS, SIMULATION, PROBLEM SOLVING (U)
IDENTIFIERS: *MANAGEMENT INFORMATION SYSTEMS, MILITARY
PERSONNEL, MILITARY OPERATIONS, TACTICAL WARFARE (U)

THE RESEARCH IS DIRECTED TOWARD SOLVING PROBLEMS
ASSOCIATED WITH INFORMATION PROCESSING AND DECISION
MAKING BY COMMANDERS AND THEIR STAFFS. IT FOCUSES
ON ONE OR MORE ASPECTS OF EVENTS WHICH OCCUR FROM THE
TIME A COMMANDER RECEIVES HIS MISSION UNTIL HE
COMPLETES IT. THIS CHAIN OF EVENTS IS THE SYSTEM
WITHIN WHICH COMMAND DECISIONS ARE FORMULATED AND
EXECUTED--A TACTICAL OPERATIONS SYSTEM WITHIN WHICH
TACTICAL INFORMATION PROCESSING IS PERFORMED.
HUMAN INFORMATION PROCESSING AND DECISION MAKING
MAY BE OBSERVED ON AN ABSTRACT LEVEL IN THE
LABORATORY OR AS OPERATIONAL PROCEDURES IN THE FIELD.
TO PROVIDE A RESEARCH CAPABILITY RESPONSIVE TO
REQUIREMENTS FOR VARYING DEGREES OF OPERATIONAL
SIMULATION, THE COMMAND SYSTEMS PROGRAM HAS
ESTABLISHED BOTH LABORATORY AND FIELD APPROACHES.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-696 342 5/5 7/1
MEDICAL RESEARCH COUNCIL CAMBRIDGE (ENGLAND) APPLIED
PSYCHOLOGY RESEARCH UNIT

DESIGNING CONTROL ROOMS TO SUIT THE MEN IN THEM,

(U)

61 2P POULTON, E. C. ;
REPT. NO. APU-411/3:

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN BRITISH CHEMICAL
ENGINEERING, OCT 61. NO COPIES FURNISHED.

DESCRIPTORS: (•INDUSTRIAL EQUIPMENT, CONTROL PANELS),
(•INDUSTRIAL PLANTS, HUMAN FACTORS ENGINEERING),
AUTOMATION, PERFORMANCE(HUMAN), DESIGN, INDUSTRIAL
PSYCHOLOGY, ENVIRONMENT, INSTRUMENTATION, FAILURE,
ERRORS, GREAT BRITAIN (U)
IDENTIFIERS: •CONTROL ROOMS, GRAPHIC PANELS (U)

THE LAYOUT OF THE CONTROL ROOM IN A NEW CHEMICAL
PLANT SHOULD BE DESIGNED TO SUIT THE KIND OF MAN WHO
WILL USE IT. SOME OF THE SPECIALIZED KNOWLEDGE
REQUIRED IS AVAILABLE IN TEXTBOOKS. A CONSULTANT,
OR GIVEN TIME, A RESEARCH UNIT MAY BE ABLE TO SUPPLY
THE REST. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-697 034 5/9
AIR FORCE HUMAN RESOURCES LAB WRIGHT-PATTERSON AFB
OHIO

JOB PERFORMANCE AIDS RESEARCH, SUMMARY AND
RECOMMENDATIONS,

(U)

APR 69 28P FOLEY, JOHN F. , JR:

UNCLASSIFIED REPORT

DESCRIPTORS: (*MAINTENANCE PERSONNEL, CHECKOUT
PROCEDURES), (*ELECTRONIC EQUIPMENT, MAINTENANCE),
SIMULATORS, HUMAN FACTORS ENGINEERING, ELECTRONIC
TECHNICIANS, JOB ANALYSIS, ELECTRONIC EQUIPMENT, SMALL
TOOLS, INFORMATION RETRIEVAL, AUTOMATION, TRAINING,
MICROELECTRONICS, TOPOLOGY, COMPUTER PROGRAMMING, AIR
FORCE RESEARCH (U)
IDENTIFIERS: COMPUTER ANALYSIS, *JOBS,
*PERFORMANCE(HUMAN), TROUBLESHOOTING (U)

THE EXPERIMENTAL EVIDENCE, TO DATE, INDICATES THAT
GREAT SAVINGS BOTH IN SYSTEM MAINTENANCE EFFICIENCY
AND IN TRAINING EFFICIENCY CAN BE OBTAINED BY WELL
DESIGNED JOB PERFORMANCE AIDS. THE PURPOSE OF THE
REPORT IS TO SUMMARIZE FINDINGS, TO COMPARE THE SCOPE
OF EACH OF THE IMPORTANT EFFORTS, TO IDENTIFY AREAS
OF DIFFICULTY IN IMPLEMENTING RESEARCH FINDINGS, AND
TO MAKE RECOMMENDATIONS FOR AN IMPLEMENTATION PROGRAM
THAT WILL OBTAIN IMMEDIATE AS WELL AS LONG RANGE
GAINS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-697 587 5/5 9/2
SYSTEM DEVELOPMENT CORP SANTA MONICA CALIF

REPORT ON AUTOMATED HUMAN FACTORS TASK DATA HANDLING
RESEARCH; (U)

67 9P WISE, FRED H.; REED,
LAWRENCE E.;
CONTRACT: AF 19(628)-3418
PROJ: AF-1710
TASK: 171006
MONITOR: AMRL TR-66-117

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN HUMAN FACTORS, V9 N2 P181-
186 APR 67.

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, *DATA
PROCESSING), MAN MACHINE SYSTEMS, AUTOMATION, COMPUTER
PROGRAMMING, COMMUNICATION SYSTEMS, CLASSIFICATION,
INFORMATION RETRIEVAL, STANDARDIZATION, ELECTRONIC
EQUIPMENT, AEROSPACE MEDICINE, AIRCRAFT EQUIPMENT (U)
IDENTIFIERS: AEROSPACE ENGINEERING (U)

THE DOCUMENT REPORTS ON A JOINT RESEARCH EFFORT TO
EXPLORE AND, WHERE POSSIBLE, DEVELOP TECHNIQUES FOR
EFFICIENT HANDLING AND PROCESSING OF HUMAN FACTORS
TASK DATA GENERATED IN SUPPORT OF A PERSONNEL
SUBSYSTEM PROGRAM. THESE TECHNIQUES ARE BEING
DEVELOPED WITHIN THE CONTEXT OF AN OVERALL DATA
HANDLING SYSTEM CONCEPT WHICH WOULD OPERATE IN AN
AIR FORCE/NASA/CONTRACTOR ENVIRONMENT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-699 173 5/9 5/8 5/1
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO
CALIF

THE DEVELOPMENT OF A HUMAN EFFECTIVENESS FUNCTION
ALLOCATION METHODOLOGY (HEFAM). (U)

DESCRIPTIVE NOTE: INTERIM REPT. 1968-1969,
OCT 69 43P CONNELLY, MARILEE N. ; WILLIS,
JOE E. ;
REPT. NO: SRM-70-11
PROJ: PF39.511.001.01.02

UNCLASSIFIED REPORT

DESCRIPTORS: (•MAN MACHINE SYSTEMS, COST EFFECTIVENESS),
(•PERFORMANCE(HUMAN), OPTIMIZATION), NAVAL RESEARCH,
PERSONNEL MANAGEMENT, AUTOMATION, REVIEWS, DATA
PROCESSING, MATHEMATICAL MODELS, DATA STORAGE SYSTEMS,
HUMAN FACTORS ENGINEERING, FACTOR ANALYSIS (U)
IDENTIFIERS: INTERVIEWS (U)

THE STUDY WAS CONDUCTED IN AN ATTEMPT TO MEET THE
NAVY'S NEED FOR IMPROVED METHODS OF ASSIGNING
FUNCTIONS TO MEN, MACHINES, OR MAN/MACHINE
COMBINATIONS IN NEW SYSTEMS UNDER DEVELOPMENT.
RAPID DEVELOPMENT OF NAVY TECHNOLOGY HAS
INCREASED THE OPPORTUNITY TO AUTOMATE FUNCTIONS AND
TASKS TRADITIONALLY PERFORMED BY HUMANS. ALTHOUGH
SYSTEM RELIABILITY IS OFTEN INCREASED BY AUTOMATION,
THE COST IS FREQUENTLY ALSO INCREASED. FACED WITH
DEFINITE MISSION REQUIREMENTS AND LIMITED FINANCIAL
RESOURCES, THE NAVY MUST SELECT THOSE FUNCTION
ALLOCATION ALTERNATIVES WHICH OPTIMIZE COST/
EFFECTIVENESS DURING THE LIFETIME OF THE SYSTEM.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-704 857 5/5
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO
CALIF

HUMAN FACTORS METHODS DEVELOPMENT AND TEST: I.
EVALUATION OF THE CORRECTIVE MAINTENANCE BURDEN
PREDICTION PROCEDURE.

(U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,
MAR 70 37P LARSON, ORVIN A. ; W. LLIS,
JOE E. ;
REPT. NO. SRM-70-14
PROJ: PF39.521.014.01.01

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC EQUIPMENT, MAINTENANCE),
(*PERFORMANCE(HUMAN), MATHEMATICAL PREDICTION), NAVAL
RESEARCH, PERSONNEL MANAGEMENT, HUMAN FACTORS
ENGINEERING, MAN MACHINE SYSTEMS, DATA PROCESSING (U)
IDENTIFIERS: *CORRECTIVE MAINTENANCE (U)

THE REPORT IS TO DOCUMENT AN EVALUATION OF THE
USEFULNESS OF THE CORRECTIVE MAINTENANCE BURDEN
(CMB) PREDICTION PROCEDURE TO APPLIED SYSTEMS
RESEARCH. THE APPROACH USED WAS TO ANALYZE THE
BASIC STRUCTURE OF CMB AND THEN TO OPERATIONALLY
APPLY CMB TO AN ACTUAL DEVELOPING ELECTRONIC
SYSTEM. CMB WAS APPLIED TO TWO DISSIMILAR SYSTEMS
BY THE APPLIED SYSTEMS PERSONNEL RESEARCHERS
ASSIGNED TO THOSE SYSTEMS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-705 369 1/3 5/5 5/8
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

PROBLEMS OF THE COCKPIT ENVIRONMENT. (U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS.

MAR 70 404P

REPT. NO. AGARD-CP-55

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AVIONICS PANEL
TECHNICAL SYMPOSIUM (16TH), HELD IN COOPERATION WITH
THE AEROSPACE MEDICAL PANEL, THE FLIGHT MECHANICS
PANEL AND THE GUIDANCE AND CONTROL PANEL OF AGARD
AT AMSTERDAM (NETHERLANDS) NOV 68. NATO
FURNISHED.

DESCRIPTORS: (*COCKPITS, *HUMAN FACTORS ENGINEERING),
ENVIRONMENT, FLIGHT CREWS, STRESS(PSYCHOLOGY), MAN
MACHINE SYSTEMS, JOB ANALYSIS, DISPLAY SYSTEMS, DATA
PROCESSING, TRAINING, DESIGN, PERSONNEL MANAGEMENT,
AVIATION SAFETY, ALL WEATHER AVIATION (U)

CONTENTS: THE PROBLEMS OF DETERMINING CREW
CAPABILITY UNDER STRESS; PROBLEMS IN ANALYSIS AND
MEASUREMENT OF INFORMATION TRANSFER REQUIREMENTS AND
EFFECTIVENESS FOR VARIOUS MISSIONS; THE PROBLEMS OF
CORRELATING CREW TRAINING, CREW SIZE AND COMPOSITION,
AND AUTOMATED ASSISTANCE; THE PROBLEMS OF COCKPIT
DESIGN INCLUDING INSTRUMENTATION COMPUTER/DISPLAY/
CONTROL SYSTEMS AND COMPONENTS; THE PROBLEMS OF
COCKPIT INFORMATION GENERATION; OPEN FORUM FOR
INTER-DISCIPLINARY DISCUSSIONS; THE PROBLEMS OF
DERIVING IN-COCKPIT AND HEAD-UP INFORMATION DISPLAY
CONFIGURATIONS; AND SESSION CHAIRMEN, SUMMARY AND
CONCLUSIONS--PRESENTATIONS TO WHOLE ASSEMBLY. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-707 544 9/2
INTERNATIONAL BUSINESS MACHINES CORP SAN JOSE CALIF SAN
JOSE RESEARCH LAB

FILE DESIGN-A PRACTICAL APPROACH. VOLUME II.
FILE ORGANIZATION MODELING SYSTEM - USER'S
MANUAL.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
OCT 69 83P SENKO, MICHAEL E. ; MEADOW,
HARRIET R. ;
CONTRACT: F30602-69-C-0100
PROJ: AF-4594
TASK: 459403
MONITOR: RADC TR-69-392-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME I, AD-707 155.

DESCRIPTORS: (*DATA PROCESSING, DESIGN), (*MEMORY
DEVICES, SELECTION), COMPUTER PROGRAMMING, INFORMATION
RETRIEVAL, MANAGEMENT PLANNING AND CONTROL, COST
EFFECTIVENESS, EFFICIENCY, MATHEMATICAL MODELS,
SIMULATION

(U)

IDENTIFIERS: *FILE STRUCTURES

(U)

THE PROTOTYPE FILE DESIGN HANDBOOK CONTAINS
EXTENSIVE QUANTITATIVE FILE DESIGN DISCUSSION. THE
BASIC FOUNDATION OF THE DISCUSSION IS PROVIDED BY
TABLES AND GRAPHS DERIVED FROM HUNDREDS OF ACTUAL
MACHINE AND SIMULATION MODEL RUNS. THESE RUNS TAKE
INTO CONSIDERATION ALL THE COMPLEX CHARACTERISTICS OF
REAL-LIFE ACCESS METHODS AND THEREBY INSURE AGAINST
OVERSIMPLIFIED ABSTRACTIONS WHICH TEND TO
OVERESTIMATE PERFORMANCE. THE FILE DESIGNER CAN USE
THESE TABLES TO OBTAIN QUANTITATIVE ESTIMATES OF
PERFORMANCE FOR ANALOGIES TO HIS PROBLEM AND TO
OBTAIN GENERAL INFORMATION WITH REGARD TO TRENDS AND
DISCONTINUITIES IN ACCESS METHOD BEHAVIOR. THE TEXT
CONTAINS DISCUSSIONS OF GENERALIZATIONS THAT APPEAR
TO BE VALIDLY DERIVABLE FROM THE TABLES. FINALLY,
IN SEVERAL INSTANCES, APPROXIMATE EQUATIONS HAVE BEEN
PROVIDED TO FURTHER QUANTIFY THE GENERALIZATIONS FOR
THE DESIGNER. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-707 719 5/9 9/2
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO
CALIF

HUMAN FACTORS METHODS DEVELOPMENT AND TEST: II.
EVALUATION OF THE AUTOMATED OPERATIONAL SEQUENCE
DIAGRAM (OSD). (U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,
MAY 76 45P LARSON, ORVIN A.; WILLIS,
JOE E.;
REPT. NO: SRM-70-17
PROJ: PF39.521.014.01.01

UNCLASSIFIED REPORT

DESCRIPTORS: (PERSONNEL MANAGEMENT, DATA PROCESSING),
(NAVAL RESEARCH, MAN MACHINE SYSTEMS),
SEQUENCES (MATHEMATICS), SYMBOLS, AUTOMATION, SYSTEMS
ENGINEERING, QUESTIONNAIRES, HUMAN FACTORS ENGINEERING,
JOB ANALYSIS, FLOW CHARTING (U)

THE REPORT DOCUMENTS AN EVALUATION OF AN AUTOMATED
VERSION OF THE OPERATIONAL SEQUENCE DIAGRAM (OSD)
FOR USE IN PERSONNEL RESEARCH. AUTOMATION OF THE
OSD HEREIN REFERS TO THE USE OF ALPHANUMERIC
CHARACTERS TO REPLACE GEOMETRIC SYMBOLS AND THE USE
OF NON-COMPUTERIZED AUTOMATIC DATA PROCESSING (ADP)
METHODS TO PRODUCE THE OSD. IN-HOUSE PERSONNEL
RESEARCHERS WERE SURVEYED TO DETERMINE THE CURRENT
USAGE OF OSDS AND THE USER PERCEIVED STRENGTHS AND
WEAKNESSES OF OSDS FOR PERSONNEL RESEARCH. THREE
VARIATIONS OF A BASIC AUTOMATED OSD WERE DEVELOPED
AND EVALUATED. TWO OF THE AUTOMATED OSD FORMATS
WERE EVALUATED BY APPLICATION TO NAVY WEAPON AND
SUPPORT SYSTEMS WHICH WERE UNDER DEVELOPMENT.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO: /ZHK13

AD-709 061 5/5
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

THE COLLECTION AND ANALYSIS OF HUMAN FACTORS DATA IN
TASK ANALYSIS. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS.
APR 70 52P KEMPF, RODNEY PAUL ;

UNCLASSIFIED REPORT

DESCRIPTORS: (*JOB ANALYSIS, HUMAN FACTORS ENGINEERING),
(*DATA PROCESSING, FEASIBILITY STUDIES), QUESTIONNAIRES,
ANALYSIS OF VARIANCE, STATISTICAL PROCESSES, COMPUTER
PROGRAMMING, NAVAL RESEARCH, THESES (U)

THE PAPER DEVELOPS A QUESTIONNAIRE TO BE USED IN
DETERMINING THE NECESSITY OF VARIOUS HUMAN FACTORS TO
THE SUCCESSFUL PERFORMANCE OF ANY PARTICULAR JOB.
INCLUDED IN THE PROPOSED QUESTIONNAIRE ARE FIFTY-
EIGHT CHARACTERISTICS AND A SCHEME FOR RATING THE
VARIABLES. A PROGRAM IS DEVELOPED FOR ANALYZING
THE DATA COLLECTED. A TWO-WAY ANALYSIS OF VARIANCE
BY RANKS IS USED TO DETECT SIGNIFICANT DIFFERENCE
BETWEEN THE CHARACTERISTICS, AND, GIVEN A DIFFERENCE
EXISTS, A METHOD SIMILAR TO THE MULTIPLE RANGE TEST
IS EMPLOYED TO SEPARATE THE SEVERAL CHARACTERISTICS
INTO SIGNIFICANCE GROUPS, THE VARIOUS GROUPS BEING
RANKED ON AN ORDINAL SCALE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-709 460 1/4 5/5
UNITED AIRCRAFT CORP NORWALK CONN NORDEN DIV

INTEGRATED VERTICAL DISPLAY RESEARCH.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,
JUL 70 158P WOODING, HAROLD C. , JR.;
SIMPSON, JOHN A. ; HARPER, H. ; SWEETNAM, R. ;
REPT. NO. 1161-R-0037
CONTRACT: NONR-4489(00)
PROJ: NR-213-036
MONITOR: JANAIR 680611

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SPONSORED IN PART BY NAVAL AIR
SYSTEMS COMMAND, WASHINGTON, D. C., AND ARMY
ELECTRONICS COMMAND, FORT MONMOUTH, N. J.

DESCRIPTORS: (*FLIGHT INSTRUMENTS, DISPLAY SYSTEMS),
PROBLEM SOLVING, SYSTEMS ENGINEERING, EXPERIMENTAL
DESIGN, SPECIFICATIONS, MODELS(SIMULATIONS), DATA
PROCESSING, HUMAN FACTORS ENGINEERING, MISSION PROFILES,
PERFORMANCE(HUMAN), STATISTICAL ANALYSIS, HELICOPTERS,
JET AIRCRAFT, PERFORMANCE(ENGINEERING) (U)
IDENTIFIERS: CRITERIA, EVALUATION (U)

SIMULATION STUDIES WERE CONDUCTED WITH EIGHT
CIVILIAN AND MILITARY PILOT SUBJECTS. A SERIES OF
FLIGHT MANEUVERS WERE PERFORMED USING A HYPOTHETICAL
TILT-WING VEHICLE, AND THE INTEGRATED ELECTRONIC
VERTICAL DISPLAY (IEVD) WITH A SET OF CONVENTIONAL
INSTRUMENTS. COMPREHENSIVE DATA ACQUISITION,
COMPUTATION AND ONLINE PRINTOUT OF ERROR SCORES WERE
UTILIZED. DATA REDUCTION AND STATISTICAL ANALYSIS
ENSUED TO DETERMINE THE EFFICACY OF PERFORMANCE TO
THE CRITERIA MODEL AND TO THE SET OF CONVENTIONAL
INSTRUMENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-710 396 5/9 9/2
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO
CALIF

NEW SYSTEMS PERSONNEL REQUIREMENTS DATA SYSTEM
(NSPRDS) COMPUTER SOFTWARE SUBSYSTEM
DEVELOPMENTS.

(U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,
JUL 70 36P MEGLING, ROBERT C. ;
REPT. NO. SRM-71-3
PROJ: NPTRL-43-07X-B5

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN FACTORS ENGINEERING, INFORMATION
RETRIEVAL), (NAVAL PERSONNEL, DATA PROCESSING),
PERSONNEL MANAGEMENT, DATA STORAGE SYSTEMS, COMPUTER
PROGRAMMING, MANAGEMENT PLANNING AND CONTROL, INPUT
OUTPUT DEVICES, MAN MACHINE SYSTEMS, TRAINING, TIME,
EFFECTIVENESS

(U)

IDENTIFIERS: NEW SYSTEMS PERSONNEL REQUIREMENTS DATA
SYSTEM, NSPRDS (NEW SYSTEMS PERSONNEL REQUIREMENTS DATA
SYSTEM), DATA BANKS

(U)

A NEW PERSONNEL REQUIREMENTS SYSTEM IS BEING
DEVELOPED FOR THE ORDERLY GENERATION, MAINTENANCE,
UPDATING, AND APPLICATION OF DETAILED TASK ANALYSIS
INFORMATION THROUGHOUT THE DEVELOPMENT CYCLE OF
NAVY WEAPON AND SUPPORT SYSTEMS. THE PURPOSE OF
THE RESEARCH REPORTED HEREIN WAS TO EVALUATE THE
APPLICABILITY OF THE SYSTEM, TO MANIPULATE HUMAN
FACTORS DATA IN A MODERN COMPUTER ENVIRONMENT.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-711 807 5/9 5/8
NAVAL PERSONNEL AND TRAINING RESEARCH LAB SAN DIEGO
CALIF

TASK ANALYSIS REDUCTION TECHNIQUE (TART) FOR THE
QUANTIFICATION OF HUMAN PERFORMANCE. (U)

DESCRIPTIVE NOTE: RESEARCH MEMO.,
SEP 70 38P ELLIS, ROBERT H. ;
REPT. NO. SRM-71-7
PROJ: PF39.511.003.01.03

UNCLASSIFIED REPORT

DESCRIPTORS: (*MAN MACHINE SYSTEMS, ANTISUBMARINE
WARFARE), (*PERFORMANCE(HUMAN), STATISTICAL ANALYSIS),
HUMAN FACTORS ENGINEERING, FACTOR ANALYSIS, TACTICAL AIR
SUPPORT, DATA PROCESSING, PERFORMANCE(HUMAN),
SIMULATION, NAVAL RESEARCH, PERSONNEL MANAGEMENT (U)

A TASK ANALYSIS REDUCTION TECHNIQUE
(TART) FOR COLLECTING HUMAN FACTORS INFORMATION WAS
DEVELOPED AND APPLIED TO THE ANTI-SUBMARINE WARFARE
TACTICAL DATA SYSTEM. TART IS A SPECIFIC PROCEDURE
FOR ANALYZING THE MAN/MACHINE INTERFACE WHICH ALLOWS
THE RESEARCHER TO ANALYZE SEQUENTIAL PROPERTIES OF
THE MAN/MACHINE INTERACTION. THE TECHNIQUE IS BASED
ON AN ANALYSIS OF THE INTERFACE AT A TASK LEVEL AND
USES CLOSED CIRCUIT TELEVISION AND VIDEO TAPE
RECORDING APPARATUS. A TRIAL APPLICATION WAS
PERFORMED USING FOUR AIR DETECTOR/TRACKERS WHO WERE
PRESENTED A ONE-HOUR AIR SCENARIO IN THE ANTI-
SUBMARINE WARFARE TACTICAL DATA SYSTEM. THE RESULTS
SECTION PRESENTS VARIOUS BREAKDOWNS OF THE TART
DATA AND INDICATE THAT TART CAN PROVIDE VALUABLE
INSIGHT INTO MAN/MACHINE DESIGN AND TRAINING
EFFECTIVENESS DECISIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY · SEARCH CONTROL NO. /ZHK13

AD-712 695 9/2 5/8
RAND CORP SANTA MONICA CALIF

COMPARING BEHAVIOR AT VARIOUS COMPUTER DISPLAY
CONSOLES IN TIME-SHARED LEGAL INFORMATION, (U)

SEP 70 45P CARLISLE, JAMES H. ;
REPT. NO. F-4448

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH YALE
UNIV., NEW HAVEN, CONN.

DESCRIPTORS: (*INPUT OUTPUT DEVICES, *MAN MACHINE
SYSTEMS), (*TIME SHARING, MAN MACHINE SYSTEMS),
PERFORMANCE(HUMAN), REMOTE CONTROL, CONTROL PANELS,
COMPUTERS, ANALYSIS OF VARIANCE, TELETYPE SYSTEMS,
TELEVISION DISPLAY SYSTEMS, FACTOR ANALYSIS, HUMAN
FACTORS ENGINEERING, TIME SHARING, UNIVERSITIES, LAW (U)
IDENTIFIERS: MAN COMPUTER INTERACTIONS, REMOTE
COMPUTER CONSOLES (U)

THE OBJECTIVE OF THE RESEARCH METHODOLOGY PROJECT
IS TO EXAMINE THE MAN-MACHINE INTERACTION WHICH TAKES
PLACE AT THE REMOTE CONSOLE OF A TIME-SHARED
COMPUTER. AN ANALYTICAL TECHNIQUE UTILIZING A
MULTIVARIATE DISCRIMINATE ANALYSIS IS EMPLOYED IN
ORDER TO COMPARE BEHAVIOR AT DIFFERENT CONSOLES.
FROM THIS DISCRIMINATE ANALYSIS, SOME CRITICAL
DIFFERENCES BETWEEN CONSOLES ARE IDENTIFIED AND
MEASURED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-715 204 9/2 5/5
MASSACHUSETTS INST OF TECH CAMBRIDGE

TECHNICAL AND HUMAN ENGINEERING PROBLEMS IN
CONNECTING TERMINALS TO A TIME-SHARING
SYSTEM,

(U)

70 8P OSSANNA, J. F. ;SALTZER, J.

H. i
CONTRACT: NONR-4102(01)

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN AFIPS CONFERENCE
PROCEEDINGS, V37 P355-362 1970 FALL JOINT COMPUTER
CONFERENCE.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH BELL
TELEPHONE LABS., INC., MURRAY HILL, N. J.

DESCRIPTORS: (*DATA PROCESSING, TIME SHARING), (*INPUT
OUTPUT DEVICES, HUMAN FACTORS ENGINEERING), REMOTE
CONTROL, DIGITAL COMPUTERS, TELETYPE SYSTEMS (U)
IDENTIFIERS: TELETYPE SYSTEMS (U)

TODAY, AN INCREASING NUMBER OF COMPUTER SYSTEMS ARE
USED INTERACTIVELY BY THEIR USER COMMUNITIES.
INTERACTIVE USE OF COMPUTERS, INVOLVING MORE
PROLONGED MAN-MACHINE CONTACT THAN NON-INTERACTIVE
USE, REQUIRES A WELL HUMAN ENGINEERED USER-SYSTEM
INTERFACE. THE INTERACTIVE USER'S PERFORMANCE--HIS
RATE OF DOING WORK AND HIS ABILITY AND DESIRE TO
UTILIZE SYSTEM CAPABILITY--IS A SENSITIVE FUNCTION OF
THE SUCCESS OF THIS HUMAN ENGINEERING. IN TURN, THE
COMPUTER SYSTEM'S EFFECTIVENESS DEPENDS ON ACHIEVING
A SATISFACTORY LEVEL OF USER PERFORMANCE WITH
REASONABLE EFFICIENCY. THE PAPER IS CONCERNED WITH
THE HUMAN ENGINEERING OF CONNECTING TYPEWRITER-LIKE
TERMINALS TO GENERAL PURPOSE TIME-SHARING SYSTEMS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-716 473 5/9
ROWLAND AND CO HADDONFIELD N J

ANNUAL REPORT IN SUPPORT OF ADVANCED
DEVELOPMENT OBJECTIVE 43-13, HUMAN FACTORS
TECHNOLOGY.

(U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 1, 1 DEC 69-30 NOV
70.

NOV 70 164P MARLOWE, EDWARD ; ESCOBAR,
CARLOS ; ROWLAND, GEORGE E. ;
REPT. NO. R/C-70-11-105
CONTRACT: N00014-70-C-0126
PROJ: NR-154-319

UNCLASSIFIED REPORT

DESCRIPTORS: (*PILOTS, NAVAL TRAINING), (*PERSONNEL
MANAGEMENT, DATA PROCESSING), (*PROGRAMMED INSTRUCTION,
ADAPTIVE SYSTEMS), MANAGEMENT ENGINEERING, HUMAN FACTORS
ENGINEERING, COMPUTER PROGRAMMING, TEACHING METHODS,
SELECTION, TEST CONSTRUCTION(PSYCHOLOGY), MATHEMATICAL
PREDICTION, SEQUENCES(MATHEMATICS) (U)

IDENTIFIERS: COMPUTER AIDED INSTRUCTION, DATA BANKS,
*DATA MANAGEMENT (U)

THE REPORT DESCRIBES THE APPROACH USED AND THE
PROGRESS MADE IN THE APPLICATION OF EXISTING
KNOWLEDGE AND TECHNOLOGY TO THE TEST OF COMPUTERIZED
TECHNIQUES WHICH INCORPORATE ADAPTIVE TRAINING
CONCEPTS AND IMPROVED TECHNIQUES FOR THE PREDICTION OF
NAVAL FLIGHT STUDENT TRAINING SUCCESS. BECAUSE
THESE COMPUTERIZED TECHNIQUES REQUIRE A UNIQUE
COMBINATION OF SPECIAL DATA INPUTS, DATA FILE
ORGANIZATION, AND SPECIFIC COMPUTER SOFTWARE ROUTINES
TO PROCESS THE FILE DATA, THIS COMBINATION IS CALLED
A DATA MANAGEMENT SYSTEM. THE SYSTEM WILL CONSIST
OF A NEWLY DEFINED DATA BANK AND FILE ORGANIZATION OF
STUDENT PILOT SELECTION, PERFORMANCE AND
ADMINISTRATIVE DATA; COMPUTERIZED TECHNIQUES FOR
PROCESSING THESE DATA ARE DEVELOPED TO SUPPORT A
SERIES OF FOURTEEN SYSTEM MODULES. WHEN IMPLEMENTED
THE DATA MANAGEMENT SYSTEM IS EXPECTED TO PROVIDE
IMPROVED PROCEDURES FOR THE HANDLING OF STUDENT PILOT
TRAINING. THESE IMPROVED PROCEDURES CAN BE EXPECTED
TO RESULT IN REDUCED ATTRITION IN THE FLIGHT
SYLLABUS, MORE EFFECTIVE PLACEMENT OF STUDENTS IN THE
PIPELINES, IN POSSIBLE CHANGES IN THE FLIGHT SYLLABUS
CONTENT, FLIGHT HOURS, AND SYLLABUS DURATION FOR
CERTAIN STUDENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-718 383 5/5 5/10
APPLIED PSYCHOLOGICAL SERVICES INC WAYNE PA SCIENCE
CENTR

MANUAL OF INSTRUCTIONS FOR THE ANALYTIC
PROFILE SYSTEM,

(U)

DEC 70 37P
REPT. NO. APS-7071-4
CONTRACT: N00014-66-C-0183
PROJ: NR-196-076

UNCLASSIFIED REPORT

DESCRIPTORS: (*DISPLAY SYSTEMS, HUMAN FACTORS
ENGINEERING), (*PSYCHOLOGICAL TESTS, HUMAN FACTORS
ENGINEERING), MAN MACHINE SYSTEMS, INSTRUCTION MANUALS,
STATISTICAL PROCESSES, FACTOR ANALYSIS, CODING, DATA
PROCESSING

(U)

IDENTIFIERS: EVALUATION

(U)

INFORMATION IS PRESENTED REGARDING THE APPLICATION,
SCORING, AND INTERPRETATION OF THE ANALYTIC
PROFILE SYSTEM, A PSYCHOMETRIC TECHNIQUE FOR
PERFORMING A HUMAN FACTORS EVALUATION OF THE VISUAL
DISPLAYS IN A MAN-MACHINE SYSTEM. A REVIEW OF THE
RESEARCH PERFORMED DURING THE DEVELOPMENT OF THE
TECHNIQUE IS INCLUDED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-719 108 5/5 14/2
ARMY TEST AND EVALUATION COMMAND ABERDEEN PROVING GROUND
MD

HUMAN FACTORS. (U)

DESCRIPTIVE NOTE: FINAL REPT. ON MATERIEL TEST PROCEDURE.
DEC 70 22P
REPT. NO. MTP-7-3-510
PROJ: AMCR-310-6

UNCLASSIFIED REPORT

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, TEST METHODS),
TEST EQUIPMENT, NOISE, VISIBILITY, ENVIRONMENT, MILITARY
FACILITIES, CONTROL SYSTEMS, DISPLAY SYSTEMS,
INSTALLATION, RELIABILITY, MAINTENANCE, SAFETY, DATA
PROCESSING (U)

IDENTIFIERS: *AVIONICS, *COMMON ENGINEERING TEST
PROCEDURES, EVALUATION (U)

HUMAN FACTOR CONSIDERATIONS APPLICABLE TO AVIATION
ARMAMENT AND AVIONICS ARE DESCRIBED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-727 658 5/8
HUMAN RESOURCES RESEARCH ORGANIZATION ALEXANDRIA VA
MAN IN CONTROL OF HIGHLY AUTOMATED SYSTEMS,

(U)

MAY 71 14P AMMERMAN, HARRY L. ; MELCHING,
WILLIAM H. ;
REPT. NO. HUMRRO PROFESSIONAL PAPER-7-71
CONTRACT: DAHC19-70-C-0012

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE ANNUAL ARMY
HUMAN FACTORS RESEARCH AND DEVELOPMENT CONFERENCE
(16TH), FORT BLISS, TEXAS OCT 70.

DESCRIPTORS: (*PERFORMANCE(HUMAN), COMMAND + CONTROL
SYSTEMS), (*AUTOMATION, *MAN-MACHINE SYSTEMS), CONTROL
PANELS, DECISION MAKING, RELIABILITY, HUMAN ENGINEERING,
FACTOR ANALYSIS (U)

THE IDENTIFICATION OF WHAT MAN SHOULD DO AS A
DECISION MAKER AND CONTROLLER IN THE NEWLY EVOLVING
MAN-MACHINE SYSTEMS IS CONSIDERED. AMONG THE TOPICS
DISCUSSED ARE MAN'S UNDERLYING BASIC FUNCTIONS IN A
COMPLEX SYSTEM, TASK ACTIVITIES FOR INDIVIDUAL JOBS
AND THEIR ANALYSES, AND TRAINING AND THE DESIGN OF
OPERATIONAL JOB POSITIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-728 529 5/8 5/9
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

CONCERNING THE EVALUATION AND AGGREGATION OF
PROBABILISTIC EVIDENCE BY MAN-MACHINE
SYSTEMS,

(U)

69 12P SCHUM, DAVID A. ;
CONTRACT: AF 33(615)-2248
PROJ: AF-7184
TASK: 718403
MONITOR: AMRL TR-69-143

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN PROCESSINGS OF THE CONGRESS
ON INFORMATION SCIENCES AND TECHNOLOGY (3RD),
P337-347.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH RICE
UNIV., HOUSTON, TEX.

DESCRIPTORS: (*MAN-MACHINE SYSTEMS,
*PERFORMANCE(HUMAN)), HUMAN ENGINEERING, AUTOMATION,
PROBABILITY, DECISION THEORY, STATISTICAL ANALYSIS,
PERFORMANCE TESTS, SIMULATION (U)
IDENTIFIERS: BAYES THEOREM, BAYESIAN ANALYSIS, (U)
INFORMATION PROCESSING(PSYCHOLOGY)

THE REPORT DESCRIBES SOME OF THE FEATURES OF
PRESENT RESEARCH ON MAN'S ROLE IN DIAGNOSTIC SYSTEMS
AND DISCUSSES THE MANNER IN WHICH SYSTEM PERFORMANCE
CRITERION PROBLEMS HAVE AFFECTED THESE EFFORTS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-731 186 5/5 5/9 17/4
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB
OHIO

DISPLAY DESIGN FOR ELECTRONIC COUNTERMEASURES
APPLICATION--SCOPE SIZE AND THREAT
DENSITY.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT. OCT 70-JAN 71,
JUL 71 29P THORBURN, DAVID E. ; SHARP,
EARL D. ; KANA, WILLIAM N. ; LYONS, JOHN P. ;
REPT. NO. AMRL-TR-71-69
PROJ: AF-7184
TASK: 718410

UNCLASSIFIED REPORT

DESCRIPTORS: (*HUMAN ENGINEERING, *DISPLAY SYSTEMS),
(*ELECTRONIC COUNTERMEASURES, DISPLAY SYSTEMS), RADAR
EQUIPMENT, VIEWING SCREENS, PERFORMANCE(HUMAN), DESIG(U)
IDENTIFIERS: COMPUTER GRAPHICS (U)

SUBJECTS WERE REQUIRED TO IDENTIFY THREAT SYMBOLS
ON A SIMULATED ELECTRONIC COUNTERMEASURES (ECM)
SCOPE DISPLAY WHILE PERFORMING A SINGLE-AXIS, FIRST-
ORDER, UNSTABLE COMPENSATORY TRACKING TASK.
PERFORMANCE WITH 3- AND 4-INCH-DIAMETER DISPLAY
SCOPES WAS COMPARED. A REPEATED-MEASURES
EXPERIMENTAL DESIGN WAS USED INVOLVING TWO DIFFERENT
30-MINUTE TEST MISSIONS -- EACH VARYING IN THREAT
DENSITY FROM 0 TO 18. TWENTY RIGHT-HANDED MALE
COLLEGE STUDENTS SERVED AS SUBJECTS. BY COMPARING
SUBJECT PERFORMANCE AT THE VARIOUS THREAT DENSITIES
IT WAS DETERMINED THAT 7 WAS THE MAXIMUM NUMBER OF
THREATS THAT A SUBJECT COULD EFFECTIVELY PROCESS WITH
EACH SCOPE SIZE. RESULTS SHOWED NO STATISTICALLY
SIGNIFICANT DIFFERENCE IN PERFORMANCE BETWEEN THE 3-
INCH AND THE 4-INCH SCOPES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-734 432 5/8
BUNKER-RAMO CORP WESTLAKE VILLAGE CALIF ELECTRONIC
SYSTEMS DIV

COMPARATIVE ANALYSIS OF HUMAN RELIABILITY
MODELS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
NOV 71 481P MEISTER, DAVID ;
REPT. NO. L0074-107
CONTRACT: N00024-71-C-1257

UNCLASSIFIED REPORT

DESCRIPTORS: (*PERFORMANCE(HUMAN), MATHEMATICAL
PREDICTION), (*MAN-MACHINE SYSTEMS, PERFORMANCE(HUMAN)),
RELIABILITY, DATA PROCESSING SYSTEMS, DATA STORAGE
SYSTEMS, HUMAN ENGINEERING, FACTOR ANALYSIS,
MAINTAINABILITY, SIMULATION (U)
IDENTIFIERS: RECOMMENDATIONS, *DATA BANKS,
EVALUATION (U)

THE PURPOSE OF THE STUDY WAS TO DESCRIBE, ANALYZE
AND COMPARE AVAILABLE MODELS AND METHODS FOR MAKING
QUANTITATIVE PREDICTIONS OF HUMAN PERFORMANCE IN MAN-
MACHINE SYSTEMS. THE 22 METHODS REVIEWED WERE
DIVIDED INTO THOSE RELATING TO OPERABILITY AND
MAINTAINABILITY; OPERABILITY MODELS FURTHER SUBDIVIDE
INTO ANALYTIC (NON-SIMULATION) AND SIMULATION
MODELS. EACH MODEL WAS ANALYZED IN TERMS OF GOALS,
ASSUMPTIONS, SCOPE, PARAMETERS, DATA REQUIREMENTS,
PROCEDURES AND VALIDATION/APPLICATION STUDIES. THE
REPORT PROVIDES REQUIREMENTS FOR DEVELOPMENT OF INPUT
DATA BANKS AND DATA PRESENTATION FORMATS. THE MOST
RECENT STUDIES AND THE STATE OF THE ART OF HUMAN
RELIABILITY PREDICTION ARE REVIEWED.
RECOMMENDATIONS FOR FURTHER RESEARCH ARE MADE,
CENTERING AROUND A SURVEY OF USER NEEDS FOR
PREDICTIVE DATA. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-736 868 5/10 5/8
HUMAN ENGINEERING LABS ABERDEEN PROVING GROUND MD

EXPERIMENTS UTILIZING COMMAND/CONTROL
SIMULATOR. 1. ON-LINE PARTIAL DATA
REDUCTION IN REACTION TIME EXPERIMENTS. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,
DEC 71 31P DAVIS, C. JANE ;
REPT. NO. HEL-TN-5-71

UNCLASSIFIED REPORT

DESCRIPTORS: (•REACTION(PSYCHOLOGY), REFLEXES),
(•SIMULATORS, PERFORMANCE(HUMAN)), COMMAND AND CONTROL
SYSTEMS, DATA PROCESSING, DISPLAY SYSTEMS, COMPUTER
PROGRAMS, HUMAN FACTORS ENGINEERING (U)
IDENTIFIERS: ON LINE SYSTEMS, DATA REDUCTION (U)

REACTION TIME EXPERIMENTS WERE CONDUCTED ON A
COMMAND/CONTROL SIMULATOR SYSTEM. THE SYSTEM
CONSISTS OF THREE COMPUTER-DRIVEN DISPLAYS WITH
PERIPHERAL CONTROL DEVICES. A PROGRAM FOR ON-LINE
PARTIAL DATA REDUCTION DURING EXPERIMENTAL RUNS WAS
DEVELOPED. THIS PROGRAM WAS WRITTEN FOR THE
VARIAN 620 I AND IS ADAPTABLE TO SIMILAR MINI-
COMPUTERS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-737 266 9/2 17/2
ANALYTICS INC ARLINGTON VA

AN INVESTIGATION INTO SOFTWARE STRUCTURES FOR
MAN/MACHINE INTERACTIONS.

(U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPT.,
FEB 72 87P NICHOLSON, RICHARD M. ;
WIGGINS, BRYAN D. ; SILVER, CARL A. ;
CONTRACT: N00014-71-C-0283
PROJ: NR-196-103

UNCLASSIFIED REPORT

DESCRIPTORS: (*DATA PROCESSING, NAVAL OPERATIONS),
(*COMMAND AND CONTROL SYSTEMS, HUMAN FACTORS
ENGINEERING), (*COMPUTER PROGRAMMING, INFORMATION
RETRIEVAL), MAN MACHINE SYSTEMS, DECISION MAKING (U)
IDENTIFIERS: MAN MACHINE SYSTEMS, *MANAGEMENT (U)
INFORMATION SYSTEMS, INFORMATION SYSTEMS

THE CURRENT TREND IN COMMAND AND CONTROL/
INFORMATION SYSTEMS WITHIN THE NAVY, TOWARD GREATER
USE OF INTERACTIVE CAPABILITIES, HAS THE EFFECT OF
BRINGING THE TRUE 'USER'--THE DECISION-MAKER--INTO
DIRECT CONTACT WITH THE SYSTEM, RATHER THAN USING A
PROGRAMMER AS AN INTERMEDIARY. IT IS THEREFORE
NECESSARY THAT THE SYSTEM DESIGNER ORIENT THE MAN/
MACHINE COMMUNICATION LESS TOWARD HIS OWN PROGRAMMING
COMMUNITY AND MORE TOWARD A USER WHOSE FAMILIARITY
WITH COMPUTER DEVICES AND TERMINOLOGY IS SOMEWHAT
LESS THAN HIS OWN. FOR A CLEAR VIEW OF THE TYPICAL
USER AND THE FUNCTIONS HE AND THE SYSTEM PERFORM, A
SURVEY OF RECENT NAVY SYSTEMS IS DESCRIBED. A
REVIEW OF THE LITERATURE IN INFORMATION SYSTEMS TO
DETERMINE THE AVAILABILITY OF INFORMATION USEFUL TO
THE SYSTEM DESIGNER IN INTERACTIVE SOFTWARE
PERFORMANCE IS PRESENTED. FINALLY, A RESEARCH
PROGRAM TO DERIVE THE NEEDED INFORMATION IS PROPOSED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-738 322 5/10 5/2
BUNKER-RAMO CORP WESTLAKE VILLAGE CALIF

DEVELOPMENT OF A HUMAN PERFORMANCE
RELIABILITY DATA SYSTEM: PHASE I.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
DEC 71 163P MEISTER, DAVID ; MILLS, ROBERT

G. i

CONTRACT: F33615-70-C-1518
PROJ: AF-7184
TASK: 718409
MONITOR: AMRL TR-71-87

UNCLASSIFIED REPORT

DESCRIPTORS: (*PERFORMANCE(HUMAN); *RELIABILITY); (*DATA
PROCESSING; *HUMAN FACTORS ENGINEERING); (*MAN MACHINE
SYSTEMS; *INFORMATION RETRIEVAL); CLASSIFICATION (U)

THE HUMAN PERFORMANCE RELIABILITY (HPR) DATA
SYSTEM DEVELOPED CONSISTS OF ASSUMPTIONS, GOALS AND
DEFINITIONS, A STRUCTURE FOR CLASSIFYING DATA
ELEMENTS, PROCEDURES FOR DEVELOPING A DATA BANK AND
PROCEDURES FOR RETRIEVING HPR DATA FROM THAT BANK.
THE HEART OF THE HPR SYSTEM IS A TAXONOMIC
STRUCTURE FOR CLASSIFYING BOTH GENERAL BEHAVIORAL AND
MAN-MACHINE SPECIFIC STUDIES. STUDIES ARE
CLASSIFIED IN TERMS OF THE BEHAVIORAL FUNCTION
PERFORMED, THE STIMULI PRESENTED AND THE EQUIPMENT
USED TO RESPOND, ENVIRONMENTAL, SUBJECT AND TASK
CHARACTERISTICS. THE END PRODUCT OF THE
CLASSIFICATION IS A DESCRIPTOR USED TO RETRIEVE DATA.
DATA ARE RETRIEVED BY FIRST ENCODING A QUESTION
ASKED OF THE HPR SYSTEM, I.E. BY TRANSLATING THE
QUESTION INTO DESCRIPTOR CATEGORIES. THE SYSTEM
THEN OPERATES ON THE BASIS OF 'AND/OR' LOGIC TO SORT
PROGRESSIVELY THROUGH THE VARIOUS CATEGORIES TO
ACHIEVE THE CLOSEST POSSIBLE MATCH WITH THE ENTRY
DESCRIPTOR. THUS, THE PRECISE ANSWER TO THE
QUESTION ASKED CAN BE RETRIEVED, ASSUMING THAT THE
DATA BANK CONTAINS APPROPRIATE DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-752 800 5/8
DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA

MAN-MACHINE INTERACTION. (U)

DESCRIPTIVE NOTE: REPORT BIBLIOGRAPHY DEC 53-MAR 72.
NOV 72 238P
REPT. NO. DDC-TAS-72-71

UNCLASSIFIED REPORT

DESCRIPTORS: (*MAN MACHINE SYSTEMS, *BIBLIOGRAPHIES),
INTERACTIONS, HUMAN FACTORS ENGINEERING, ADAPTIVE
CONTROL SYSTEMS, ADAPTIVE SYSTEMS, CONTROL SYSTEMS,
COMPUTERS, DECISION MAKING, FLIGHT CONTROL SYSTEMS,
PERFORMANCE(HUMAN), PERFORMANCE(ENGINEERING), PILOTS,
PERSONNEL MANAGEMENT, SYSTEMS ENGINEERING, ARTIFICIAL
INTELLIGENCE (U)

THE ANNOTATED REFERENCES INCLUDE REPORTS WHICH
STUDY THE HUMAN FACTORS INVOLVED IN SOLVING AND
LEARNING MAN-MACHINE INTERACTIONS, AS WELL AS THE
EFFECTIVE USE OF MEN IN SYSTEM DESIGN. THE INDEXES
INCLUDED ARE CORPORATE AUTHOR-MONITORING
AGENCY, AND SUBJECT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-753 748 5/8 17/9 9/2
ILLINOIS UNIV SAJOY AVIATION RESEARCH LAB

VISUAL TIME COMPRESSION: 1. PROGRAMMED
LOGIC FOR AUTOMATED TEMPORAL EXPERIMENTATION,

(U)

72 9P SCANLAN, LAWRENCE A. ; HUMMEL,
TERRY L. ;
REPT. NO. ARL-72-30/AFOSR-72-18
CONTRACT: F44620-70-C-0105
PROJ: AF-9778
MONITOR: AFOSR TR-72-2437

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN PROCEEDINGS OF THE ANNUAL
MEETING OF HUMAN FACTORS SOCIETY (16TH), LOS
ANGELES, CALIF., 17-19 OCT 72 P160-165 1972.
SUPPLEMENTARY NOTE: SEE ALSO AD-753 746.

DESCRIPTORS: (*DISPLAY SYSTEMS, *RADAR SIGNALS), TIME,
BRIGHTNESS, COMPUTERS, HUMAN FACTORS ENGINEERING,
RECORDING SYSTEMS (U)

APPARATUS FOR THE AUTOMATIC PRESENTATION OF
VISUALLY TIME-COMPRESSED STIMULI IS DESCRIBED. THE
SYSTEM CONSISTS OF A COMPUTER-CONTROLLED VIDEO TAPE
RECORDER AND ASSOCIATED HARDWARE AND SOFTWARE.
STEPS INVOLVED IN THE GENERATION OF VIDEO TAPE
RECORDINGS DEPICTING MOVING TARGETS IN RADAR CLUTTER
ARE DESCRIBED. RECORDINGS WERE FURTHER TRANSFORMED
TO OBTAIN TIME-COMPRESSED DISPLAYS HAVING DIFFERENT
TIME-COMPRESSION RATIOS AND TARGET BRIGHTNESS LEVELS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-753 864 5/5 6/11
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

A PROJECTED GRID METHOD FOR RECORDING THE
SHAPE OF THE HUMAN FACE.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
SEP 71 33P COBB, J. ;
REPT. NO. RAE-TR-71184
MONITOR: DRIC BR-28791

UNCLASSIFIED REPORT

DESCRIPTORS: (*FACE(ANATOMY), ANTHROPOMETRY),
(*ANTHROPOMETRY, DATA PROCESSING), (*OXYGEN MASKS,
DESIGN), CONFIGURATION, HUMAN FACTORS ENGINEERING,
INSTRUMENTATION, EXPERIMENTAL DESIGN
IDENTIFIERS: *GRID METHOD

(U)

(U)

THE REPORT DESCRIBES THE WORK CARRIED OUT TO DESIGN
AN EQUIPMENT WHICH WOULD QUICKLY AND CHEAPLY RECORD
THE SHAPES OF A LARGE NUMBER OF HUMAN FACES. IT IS
INTENDED FOR USE IN AN ANTHROPOMETRIC SURVEY WITH A
VIEW TO PROVIDING DATA FOR A PROJECT AIMED AT
IMPROVING THE FIT AND COMFORT OF OXYGEN MASKS FOR
SERVICE USE. THE DATA WILL BE EXAMINED TO
DISCOVER A PARAMETER OF THE HUMAN FACE WHICH CAN BE
USED TO DETERMINE WHICH MASK SIZE IS BEST SUITED TO
ANY INDIVIDUAL. A SIMPLE, QUICK AND ADEQUATELY
ACCURATE EQUIPMENT FOR RECORDING ONE SIDE OF THE FACE
HAS BEEN DEVELOPED FROM AN EARLIER DESIGN AND
INCLUDES SEVERAL REFINEMENTS TO SIMPLIFY THE
ANALYSIS. THE ACCURACY OF THE EQUIPMENT HAS BEEN
MEASURED AND IS WITHIN THE REQUIRED ONE MILLIMETRE.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-754 141 5/9
ROWLAND AND CO HADDONFIELD N J

ANNUAL REPORT IN SUPPORT OF ADVANCED
DEVELOPMENT OBJECTIVE 43-13; HUMAN FACTORS
TECHNOLOGY. (U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 3, 16 MAY-15 NOV
72, ON PHASE 1,
NOV 72 125P ROWLAND, GEORGE E. ; MARLOWE,
EDWARD ; ESCOBAR, CARLOS ; GOEL, SHULLY M. ;
MONTEMERLO, MELVIN ;
REPT. NO. R/C-72-11-111
CONTRACT: N00014-72-C-0520
PROJ: NR-154-353

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED 15 MAY 72,
AD-744 984.

DESCRIPTORS: (*PILOTS, *NAVAL TRAINING),
(*PERFORMANCE(HUMAN), *DATA PROCESSING), HUMAN FACTORS
ENGINEERING, PERSONNEL MANAGEMENT, FEEDBACK, PROGRAMMED
INSTRUCTION, STUDENTS, MANAGEMENT ENGINEERING, ADAPTIVE
SYSTEMS, DECISION MAKING, COMPUTER PROGRAMMING (U)
IDENTIFIERS: *DATA MANAGEMENT (U)

THE REPORT DESCRIBES THE CONTINUED DEVELOPMENT OF A
DATA MANAGEMENT SYSTEM (DMS) AND A STUDENT
MANAGEMENT SYSTEM (SMS) FOR USE IN THE NAVAL
STUDENT PILOT TRAINING PROGRAM. THE SMS WILL BE
SQUADRON-BASED AND WILL SECURE, PROCESS AND FEED BACK
STUDENT TRAINING PROGRESS AND OUTCOME PERFORMANCE
DATA TO SQUADRON PERSONNEL. THIS SYSTEM WILL
IMPROVE THE DECISION-MAKING INVOLVED IN THE
MANAGEMENT OF THE STUDENT AVIATOR. A FAMILY OF
FEEDBACK PRODUCTS WAS DEVELOPED. PROVISIONS FOR
ADAPTIVE TRAINING ARE DISCUSSED. THE CAPABILITIES
AND LIMITATIONS OF CURRENT TECHNIQUES IN THE HANDLING
OF STUDENT PILOTS AND THE AVAILABILITY OF NEW OPTIONS
ARE DESCRIBED. THE LIMITATIONS IMPOSED BY NORM-
REFERENCED MEASUREMENT DATA ARE CITED. OPTIONS FOR
THE DEVELOPMENT OF CRITERION-REFERENCED MEASURES ARE
IDENTIFIED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-754 215 5/5
ILLINOIS UNIV SAVOY AVIATION RESEARCH LAB

EXPERIMENT SIMULATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 72 60P SIMON, CHARLES W. ;
REPT. NO. ARL-72-7/AFOSR-72-3
CONTRACT: F44620-70-C-0105
PROJ: AF-9778
MONITOR: AFOSR TR-72-2468

UNCLASSIFIED REPORT

DESCRIPTORS: (*MAN MACHINE SYSTEMS, SIMULATION), (*HUMAN
FACTORS ENGINEERING, SIMULATION), DATA PROCESSING,
REGRESSION ANALYSIS, EXPERIMENTAL DESIGN, MATHEMATICAL
MODELS (U)
IDENTIFIERS: COMPUTERIZED SIMULATION (U)

ALTHOUGH THE TRADITIONAL EXPERIMENTAL TECHNIQUES
EMPLOYED BY BEHAVIORAL SCIENTISTS ARE CONSIDERED
INADEQUATE FOR APPLIED STUDIES OF HUMANS OPERATING
WITHIN A MAN-MACHINE SYSTEM, RESEARCHERS HAVE BEEN
RELUCTANT TO ADOPT IMPROVED METHODOLOGIES. THIS
RELUCTANCE IS ATTRIBUTED TO INADEQUATE MEANS OF
EVALUATING THOSE METHODOLOGIES IN CURRENT USE AND TO
INVESTIGATORS' LACK OF EXPERIENCE WITH NEW
METHODOLOGIES. IT IS PROPOSED THAT A COMPUTER
PROGRAM WHICH SIMULATES DATA GENERATED BY LABORATORY
EXPERIMENTS CAN RESOLVE BOTH THESE PROBLEMS QUICKLY
AND ECONOMICALLY. THE PRIMARY PURPOSE OF THE
CURRENT PAPER IS TO ESTABLISH THAT SUCH A MODEL FOR
EXPERIMENT SIMULATION CAN BE DEVELOPED. THE REPORT
OUTLINES THE BASIC CHARACTERISTICS OF THE SIMULATION
MODEL, WHICH ASSUMES THE FORM OF A POLYNOMIAL
REGRESSION EQUATION. NEXT IT IDENTIFIED AND
DISCUSSES MANY OF THE FACTORS THAT USUALLY OPERATE IN
HUMAN FACTORS ENGINEERING EXPERIMENTS.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-757 627 5/2 5/5
ARMY CONSTRUCTION ENGINEERING RESEARCH LAB CHAMPAIGN
ILL

INITIAL REPORT ON SYSTEMIZING INFORMATION TO
IDENTIFY AND RELATE BEHAVIORAL AND PHYSICAL
DESIGN PARAMETERS.

(U)

DESCRIPTIVE NOTE: PRELIMINARY REPT.,
MAR 73 8P DRESSSEL, DAVID L. ; BRAUER,
ROGER L. ;
REPT. NO. CERL-PR-D-4
PROJ: DA-4-A-062103-A-891

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: REPORT ON IDENTIFICATION AND
CLASSIFICATION OF HUMAN NEEDS IN THE MILITARY FACILITY.

DESCRIPTORS: (*INFORMATION RETRIEVAL, HUMAN FACTORS
ENGINEERING), (*HUMAN FACTORS ENGINEERING, MILITARY
FACILITIES), BUILDINGS, DESIGN, BEHAVIOR, COMPUTERS (U)
IDENTIFIERS: *INFORMATION SYSTEMS (U)

THE PRELIMINARY REPORT SUMMARIZES PROGRESS TO DATE
ON DEVELOPMENT OF AN INFORMATION SYSTEM TO SERVICE
THE IDENTIFICATION AND CLASSIFICATION OF HUMAN NEEDS
IN THE MILITARY FACILITY. THE SYSTEM WILL BE USED
TO DEVELOP INFORMATION FOR DESIGN DECISIONS. AT
PRESENT, BEHAVIORAL AND DESIGN THEORIES HAVE BEEN
REVIEWED, AND HAVE PLAYED AN IMPORTANT PART IN
FORMULATING THE PILOT INFORMATION SYSTEM. THE
SYSTEM IS RESPONSIVE TO THE REQUIREMENTS OF BOTH THE
RESEARCHER AND THE DESIGNER, WITH DATA CATEGORIZED
AND TRANSLATED THROUGH THE 'RELATIONSHIP SENTENCE.'
AMENABLE TO COMPUTER INPUT, STORAGE AND DATA
RETRIEVAL, THE RELATIONSHIP SENTENCE IS A STATEMENT
OF RELATION BETWEEN CONSTRAINTS, USER ACTIVITIES, AND
PHYSICAL CHARACTERISTICS. THE STRUCTURE OF THE
RELATIONSHIP SENTENCE IS THOUGHT TO BE COMPLETE
ENOUGH FOR EASY GATHERING OF DATA FROM EXISTING
STUDIES, YET SUFFICIENTLY FLEXIBLE TO ALLOW
CATEGORIZATION OF BEHAVIORAL DATA IN VARYING DEGREES
OF EXPLICITNESS. THE OUTPUT FROM THE SYSTEM IS
INTENDED TO BE COMPATIBLE WITH DEVELOPING COMPUTER-
AIDED DESIGN PROGRAMS, IF NOT AN INTEGRAL PART OF
SUCH PROGRAM. DISCUSSED IN THIS REPORT IS THE
STRUCTURE AND FUNCTION OF THE INFORMATION SYSTEM, ITS
RELATION TO INFORMATION SCIENCE AND COMPUTER-AIDED
ARCHITECTURE, AND WORK REQUIRED FOR ITS FURTHER
DEVELOPMENT. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-758 977 22/2 1/3 5/8
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

AUTOMATION IN MANNED AEROSPACE SYSTEMS. (U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS NO. 114.
MAR 73 323P
REPT. NO. AGARD-CP-114

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (*AEROSPACE CRAFT, *MAN MACHINE SYSTEMS),
AUTOMATION, DATA PROCESSING, ATTITUDE CONTROL SYSTEMS,
NAVIGATIONAL AIDS, COMPUTERS, MANNED SPACECRAFT, FLIGHT
INSTRUMENTS, HUMAN FACTORS ENGINEERING (U)
IDENTIFIERS: AVIONICS (U)

THE CONTINUOUS EXPANSION OF AEROSPACE SYSTEM REQUIREMENTS RESULTS IN THE EVER INCREASING ASSIGNMENT OF COMPUTING, LOGIC AND DECISION MAKING FUNCTIONS TO 'ON-BOARD' DIGITAL COMPUTERS. THE NEED FOR MAN AS AN INTEGRAL ELEMENT IN AEROSPACE SYSTEMS SEEMS LIKELY FOR THE NEXT DECADE. HIS ROLE AND THE PROPER INTEGRATION OF MAN AND MACHINE FOR MAXIMUM SYSTEM EFFECTIVENESS WILL, HOWEVER, REQUIRE PERIODIC RE-EXAMINATION IN VIEW OF THE GROWING CAPABILITY OF THE MACHINE TO ASSUME FUNCTIONS PREVIOUSLY RESERVED FOR MAN. THE REPORT CONSIDERS THE CURRENT CAPABILITIES AND POTENTIALS FOR AUTOMATING MANNED AEROSPACE SYSTEMS, AND DESCRIBED THE 'TOOLS' CURRENTLY AVAILABLE AND UNDER DEVELOPMENT FOR ASSIGNING SYSTEM FUNCTIONS TO MAN, MACHINE AND MAN AND MACHINE, SO AS TO BEST SATISFY AEROSPACE SYSTEM REQUIREMENTS AND CONSTRAINTS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZHK13

AD-761 518 5/10 5/5
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF

ANALYSIS OF A DESCRIPTIVE MODEL FOR HAND
MOTION DISTANCE IN A MANUAL DECISION TASK. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,
MAR 73 56P STEWART, JOSEPH STANLEY, III;

UNCLASSIFIED REPORT

DESCRIPTORS: (*HANDS, *MOTOR REACTIONS), (*DECISION
MAKING, PERFORMANCE(HUMAN)), (*INSTRUMENT PANELS, *HUMAN
FACTORS ENGINEERING), UNCERTAINTY, MATHEMATICAL MODELS,
PERCEPTION, DATA PROCESSING, TEST EQUIPMENT, TEST
METHODS, ANALYSIS OF VARIANCE, PERFORMANCE(HUMAN),
STATISTICAL PROCESSES, DESIGN, THESES (U)
IDENTIFIERS: STIMULUS RESPONSE (U)

AN EXPERIMENTAL INVESTIGATION WAS CONDUCTED TO
EXAMINE A DESCRIPTIVE MODEL FOR HAND MOTION UNDER
DISCRETE UNCERTAINTY OF THE STIMULUS SET. THE
DESIGN AND IMPLEMENTATION OF AN AUTOMATIC, ON-LINE,
DATA COLLECTION DEVICE USING CYCLOGRAPHIC MOTION
COLLECTION METHODS IS DESCRIBED. EIGHT SUBJECTS
WERE EXPOSED TO 2.2 TO 3 BITS OF CHOICE UNCERTAINTY.
RESPONSE TIMES, ERROR RATES, AND HAND MOTION
DISTANCES WERE COLLECTED AND ANALYZED. HAND MOTION
DISTANCES WERE COMPARED TO STRAIGHT LINE DISTANCES
USED IN CONTROL PANEL DESIGN. FURTHER
INVESTIGATION INDICATED HOW THE DISTRIBUTIONS OF HAND
MOTION DISTANCES, FOR ANY STIMULUS, FIT NORMAL
CURVES, AND HOW VARIATIONS IN SUBJECT PERFORMANCE
WERE SIGNIFICANT. PERCEPTUAL ASPECTS OF THE TASK
AND OPERATOR STRATEGIES ARE DISCUSSED. FURTHER
STUDY IS SUGGESTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-763 392 5/9
CALIFORNIA UNIV BERKELEY INST OF INDUSTRIAL RELATIONS

DEVELOPMENT OF RESEARCH INSTRUMENTS AND
PROCEDURES FOR STUDYING THE HUMAN RESOURCES
OF DEVELOPING AND OPERATING ORGANIZATIONS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT. NO. 4,
MAY 73 25P BLOOD, MILTON R. ;
CONTRACT: N00014-69-A-0200-1054

UNCLASSIFIED REPORT

DESCRIPTORS: (*NAVAL AVIATION, *PERSONNEL MANAGEMENT),
(*ORGANIZATIONS, *HUMAN FACTORS ENGINEERING), RESEARCH
MANAGEMENT, DATA PROCESSING, QUESTIONNAIRES,
PERSONALITY, BACKGROUND, PSYCHOLOGICAL TESTS, SOCIAL
COMMUNICATION, MANAGEMENT PLANNING AND CONTROL, JET
FIGHTERS, OPTIMIZATION (U)
IDENTIFIERS: F-14 AIRCRAFT, *HUMAN RESOURCES (U)

A PRELIMINARY DATA COLLECTION WAS CARRIED OUT TO
TEST THE QUESTIONNAIRE AND DATA COLLECTION PROCEDURES
TO BE USED IN A LARGER PSYCHOLOGICAL STUDY OF THE
HUMAN RESOURCES OF ORGANIZATIONS. A NAVY FIGHTER
SQUADRON WAS CHOSEN SINCE THE EVENTUAL STUDY WILL BE
CONDUCTED IN THE FIRST FIGHTER SQUADRONS OF THE
NAVY F-14 PROGRAM. THE REPORT IS A PURELY
DESCRIPTIVE ACCOUNT OF THE INSTRUMENT DEVELOPMENT.
IT PRESENTS SOME RESULTS OF THE PRELIMINARY DATA
COLLECTION. (MODIFIED AUTHOR ABSTRACT) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-765 204 9/2 5/1
AIR FORCE ACADEMY COLO DEPT OF ASTRONAUTICS AND COMPUTER
SCIENCE

PROCEEDINGS OF THE ANNUAL WORLDWIDE DATA
BASE MANAGEMENT SYSTEM SYMPOSIUM (3RD)
HELD AT THE UNITED STATES AIR FORCE
ACADEMY ON 24-26 JANUARY 1973.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
JAN 73 252P WINKLER, ANTHONY J. ; GERSON,
GORDON M. ;
REPT. NO. DFACS-73-CS-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED DEC 71, AD-
742 323.

DESCRIPTORS: (*DATA PROCESSING, MANAGEMENT PLANNING AND
CONTROL), AIR FORCE RESEARCH, SYSTEMS ENGINEERING, HUMAN
FACTORS ENGINEERING, COMPUTER PROGRAMMING, SELECTION,
PERSONNEL MANAGEMENT, SYMPOSIA (U)

IDENTIFIERS: ON LINE SYSTEMS, INFORMATION SYSTEMS,
DATA MANAGEMENT (U)

;CONTENTS: AN EVOLUTIONARY APPROACH TO THE
DEVELOPMENT OF DATA BASE MANAGEMENT SYSTEMS;
SPECIAL PURPOSE DESIGN - A HUMAN FACTOR APPROACH;
THE AIR FORCE COMPUTER SELECTION PROCESS;
INFORMATION SYSTEMS RESEARCH FOR THE FUTURE; THE
APPLICATION OF A GDBMS TO SUPPORT THE DATA
ADMINISTRATOR FUNCTIONS; THE ADPS/BLMPS
TAILORED DATA MANAGEMENT SYSTEM; DATA ELEMENT
RECONCILIATION AND FILE STRUCTURING TECHNIQUE FOR
MAC'S WWMCCS ON-LINE DATA BASE; AIR FORCE ON-
LINE DATA SYSTEM; STATUS OF THE SYSTEM SURVEY
TEAM.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-767 206 5/5 13/12
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB
OHIO

COMBIMAN-COMPUTERIZED BIOMECHANICAL MAN-
MODEL. COMBIMAN-BIOMECHANISCHES COMPUTER-
MODELL DES MENSCHEN,

(U)

72 18P KROEMER, K. H. E. ;
REPT. NO. AMRL-TR-72-16
PROJ: AF-7184
TASK: 718408

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN PROCEEDINGS OF IFU
COLLOQUIUM 'SPACE TECHNOLOGY - A MODEL FOR
SAFETY TECHNIQUES AND ACCIDENT PREVENTION',
COLOGNE, GERMANY, APR 72 P73-88.

SUPPLEMENTARY NOTE: SUMMARY IN GERMAN.

DESCRIPTORS: (•HUMAN BODY, MODELS(SIMULATIONS)), (•HUMAN
FACTORS ENGINEERING, AIRCRAFT), COMPUTERS,
ANTHROPOMETRY, ERGOMETERS, MATHEMATICAL MODELS (U)
IDENTIFIERS: •BIOMECHANICS (U)

A COMPUTERIZED BODY ANALOG, REPRESENTING
ANTHROPOMETRY, BIOMECHANICS, AND ERGONOMICS, WILL BE
USEFUL IN EVALUATING EXISTING SYSTEMS AND IN THE
FUTURE WILL BE ESSENTIAL FROM THE EARLIEST STAGES IN
THE DEVELOPMENT OF NEW SYSTEMS. SUCH AN ANALOG OF
THE HUMAN OPERATOR, WITHIN THE GEOMETRY OF THE WORK
STATION, IS CURRENTLY BEING DEVELOPED. IT IS
CALLED COMBIMAN, AN ACRONYM FOR COMPUTERIZED
BIOMECHANICAL MAN-MODEL. COMBIMAN IS AN
ENGINEERING TOOL FOR REPRESENTING THE GEOMETRY AND
PHYSICS OF THE MAN-COCKPIT SYSTEM. THIS PAPER
SUMMARIZES A LITERATURE REVIEW, PRESENTS A GENERAL
DISCUSSION OF COMPUTER MODELS REPRESENTING THE
GEOMETRY OF THE OPERATOR AT HIS WORK STATION,
DEVELOPS A STRATEGY OF THE MATHEMATICAL AND
COMPUTERIZATION CONCEPTS, AND DESCRIBES THE
DEVELOPMENT PHASES OF COMBIMAN. (MODIFIED AUTHOR
ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-767 739 5/5
HUGHES AIRCRAFT CO CULVER CITY CALIF

ECONOMICAL MULTIFACTOR DESIGNS FOR HUMAN
FACTORS ENGINEERING EXPERIMENTS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 73 189P SIMON, CHARLES W. ;
REPT. NO. HAC-P73-326
CONTRACT: F44620-72-C-0086
PROJ: AF-9778
MONITOR: AFOSR TR-73-1702

UNCLASSIFIED REPORT

DESCRIPTORS: (HUMAN FACTORS ENGINEERING, FACTOR
ANALYSIS), SELECTION, EXPERIMENTAL DATA, DATA
PROCESSING, OPTIMIZATION, COSTS, MAN MACHINE SYSTEMS,
RESEARCH MANAGEMENT, MANAGEMENT PLANNING AND CONTROL,
ERRORS

(U)

IDENTIFIERS: CONCEPTS, ECONOMICAL MULTIFACTOR
DESIGNS

(U)

EXPERIMENTAL DATA COLLECTION PLANS ARE DESCRIBED
THAT PERMIT THE STUDY OF FROM FIVE TO THIRTY
EXPERIMENTAL HUMAN FACTORS. THE REPORTED PLANS
WERE SELECTED FROM THOSE EMPLOYED IN PHYSICAL SCIENCE
RESEARCH AND WERE SUITABLE FOR HUMAN FACTORS
ENGINEERING RESEARCH. THE METHOD OF EMPLOYING
THESE DESIGNS IS TWO PHASE. IN THE FIRST PHASE, A
LARGE NUMBER OF POTENTIALLY CRITICAL FACTORS ARE
SYSTEMATICALLY SCREENED IN A WAY THAT IDENTIFIES THE
MORE IMPORTANT ONES. IN THE SECOND, FUNCTIONS ARE
OBTAINED THAT RELATE THE MORE IMPORTANT QUANTITATIVE
FACTORS TO OPERATE PERFORMANCE. FIVE PRINCIPLES
THAT ENABLE ECONOMICAL MULTIFACTOR HUMAN FACTORS
EXPERIMENTS TO BE SUCCESSFULLY CONDUCTED ARE STATED.
(MODIFIED AUTHOR ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-768 415 5/9 15/5
MCDONNELL DOUGLAS ASTRONAUTICS CO-EAST ST LOUIS MO
ENGINEERING PSYCHOLOGY DEPT

PREDICTING MAINTENANCE TASK DIFFICULTY AND
PERSONNEL SKILL REQUIREMENTS BASED ON
DESIGN PARAMETERS OF AVIONICS SUBSYSTEMS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
AUG 73 134P LINTZ, LARRY M. ; LOY, SUSAN
L. ; BROCK, GERALD R. ; POTEMPA, KENNETH W. ;

CONTRACT: F33615-71-C-1620
PROJ: AF-1124
TASK: 112402
MONITOR: AFHRL TR-72-75

UNCLASSIFIED REPORT

DESCRIPTORS: (*ELECTRONIC TECHNICIANS,
*PERFORMANCE(HUMAN)), (*MAINTENANCE PERSONNEL,
PERFORMANCE(HUMAN)), COMMUNICATION SYSTEMS, FLIGHT
CONTROL SYSTEMS, HUMAN FACTORS ENGINEERING, MATHEMATICAL
PREDICTION, MATHEMATICAL MODELS, REGRESSION ANALYSIS,
TIME, COMPUTERS, DISPLAY SYSTEMS, TARGET ACQUISITION,
AIRBORNE, QUESTIONNAIRES, ANALYSIS OF VARIANCE, FIRE
CONTROL SYSTEMS, RADAR EQUIPMENT, INERTIAL NAVIGATION(U)
IDENTIFIERS: AVIONICS, TASK PERFORMANCE, DIFFICULTY
LEVELS, RATING SCALES, *SKILL LEVELS (U)

THE RELATIONSHIPS AMONG SUBSYSTEM DESIGN
CHARACTERISTICS, PERSONNEL SKILL CHARACTERISTICS,
PERSONNEL SKILL CHARACTERISTICS, AND JOB PERFORMANCE
WERE INVESTIGATED FOR AVIONICS SUBSYSTEMS. A LIST
OF DESIGN CHARACTERISTICS WAS ESTABLISHED, AND
FUNCTIONAL LOOPS AND LINE REPLACEABLE UNITS WERE
SELECTED FROM TEN SUBSYSTEMS REPRESENTING NAVIGATION,
FLIGHT CONTROL, COMMUNICATIONS, AND FIRE CONTROL
SUBSYSTEMS. EXPERIENCED SUPERVISORS IDENTIFIED HIGH
AND LOW SKILL MAINTENANCE PERSONNEL. THESE
SUPERVISORS ASSOCIATED PERFORMANCE TIMES AND ERROR
PROBABILITIES FOR THREE MAINTENANCE TASKS - AN EASY
TASK, A DIFFICULT TASK, AND A COMPLETE FUNCTIONAL
CHECKOUT TASK. SUPERVISORS ALSO RATED EACH TASK ON
A SCALE OF DIFFICULTY. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL No. /ZHK13

AD-770 129 9/2 5/8
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER BETHESDA
MD

MAN-MACHINE ROLE IDENTIFICATION IN SEEKING
IMPROVED SOLUTIONS TO LARGE-SCALE COMPUTER
SIMULATION PROBLEMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,
AUG 73 29P MANDELBAUM, JAY ; JORGENSEN,
ERIC L. ; SMITH, DENNIS E. ; STORCK, C. EDWARD
;
REPT. NO. NSRDC-4244
PROJ: RF018-96, NR-364-039
TASK: RF018-96-01

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMPUTERIZED SIMULATION, *PROBLEM
SOLVING), (*DECISION MAKING, *MAN MACHINE
SYSTEMS), COMPUTER PROGRAMMING, ALGORITHMS,
FORTRAN, OPTIMIZATION, MANUAL OPERATION,
AUTOMATION, ANTISUBMARINE WARFARE
IDENTIFIERS: OPTIMIZER COMPUTER PROGRAM

(U)

(U)

THE PAPER DESCRIBES INSIGHTS, PROCEDURES, AND
LIMITATIONS INVOLVED IN THE SEMI-AUTOMATIC SOLUTION
OF LARGE-SCALE COMPUTER SIMULATION PROBLEMS. IT
USES THE EXPERIENCE GAINED IN SOLVING TEST PROBLEMS
BY BOTH A HUMAN ANALYST AND AN AUTOMATIC OPTIMIZER
PROGRAM. PARTICULAR ATTENTION IS PAID TO TASKS
PERFORMED BY THE MAN BUT NOT THE MACHINE AND TASKS
BEST DONE BY THE MACHINE. GUIDELINES ARE SUGGESTED
FOR INCORPORATING SOME OF THE HUMAN PROBLEM-SOLVING
PROCESSES AS A FIRST STEP TOWARD INTERACTIVE SEMI-
AUTOMATIC PROCEDURES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-775 879 5/5
PERCEPTRONICS INC WOODLAND HILLS CALIF

EXPERIMENTAL STUDY OF MAN/MACHINE
INTERACTION IN ADAPTIVE COMPUTER AIDED
CONTROL.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
NOV 73 60P WELTMAN, GERSHON ; STEEB,
RANDALL ; FREEDY, AMOS ; SMITH, MICHAEL ; WEISBROD,
RICHARD ;
REPT. NO. TR-73-10
CONTRACT: N00014-72-C-0093
PROJ: NR-196-118

UNCLASSIFIED REPORT

DESCRIPTORS: *MAN MACHINE SYSTEMS, *PROBLEM SOLVING,
*ADAPTIVE CONTROL SYSTEMS, COMPUTERS, CONTROL,
DECISION MAKING, COMPUTER APPLICATIONS, HUMAN
FACTORS ENGINEERING

(U)

IDENTIFIERS: ACS(AUTONOMOUS CONTROL
SUBSYSTEMS), AUTONOMOUS CONTROL SUBSYSTEMS

(U)

THE REPORT PRESENTS THE BACKGROUND AND RESULTS OF
AN EXPERIMENTAL STUDY FOCUSING ON HUMAN FACTORS
ASPECTS OF ADAPTIVE COMPUTER AIDING. INCLUDED ARE
(1) A RATIONALE FOR SHARED DECISION AND CONTROL,
(2) A DESCRIPTION OF THE ADAPTIVE AIDING COMPUTER
PROGRAM AND TASK SIMULATION DEVELOPED FOR THE
EXPERIMENTAL STUDY, (3) THE EXPERIMENTAL DESIGN,
PROCEDURE, AND MEASUREMENT TECHNIQUES ALONG WITH A
DISCUSSION OF THE RESULTS, AND (4) THE
DEVELOPMENT AND TESTING OF A PROGRAM PROVIDING ON-
LINE ESTIMATION OF OPERATOR UTILITIES FOR HIS OWN AND
MACHINE CONTROL.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-776 235 5/9
ROWLAND AND CO HADDONFIELD N J

ANNUAL REPORT IN SUPPORT OF TECHNICAL
DEVELOPMENT PLAN 43-03X - EDUCATION AND
TRAINING DEVELOPMENT.

(U)

DESCRIPTIVE NOTE: ANNUAL REPT. NO. 4, 11 NOV 72-15 NOV
73, ON PHASE 2,
NOV 73 76P MARLOWE, EDWARD ; EXCOBAR,
CARLOS ; ROWLAND, GEORGE E. ;
REPT. NO. R/C-73-11-113
CONTRACT: N00014-72-C-0520
PROJ: NR-154 353

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO ANNUAL REPT. NO. 3, AD-
754 141.

DESCRIPTORS: *PILOTS, *NAVAL TRAINING,
*PERFORMANCE(HUMAN), *DATA PROCESSING, HUMAN
FACTORS ENGINEERING, PERSONNEL MANAGEMENT, FEEDBACK,
PROGRAMMED INSTRUCTION, STUDENTS, MANAGEMENT
ENGINEERING, ADAPTIVE SYSTEMS, DECISION MAKING,
COMPUTER PROGRAMMING, DATA MANAGEMENT

(U)

THIS IS THE FOURTH REPORT IN A SERIES WHICH
DESCRIBES THE RESULTS AND PROGRESS IN A LONG-TERM
PROGRAM TO DEVELOP A DATA MANAGEMENT SYSTEM
(DMS) AND A STUDENT MANAGEMENT SYSTEM (SMS)
FOR USE IN THE NAVAL STUDENT PILOT TRAINING
SYSTEM. THE DMS WILL CONTAIN ALL OF THE STUDENT
NAVAL AVIATOR'S DATA FILES NEEDED TO SUPPORT AN
IMPROVED STUDENT TRAINING SUCCESS PREDICTION
CAPABILITY AND PROVIDE INFORMATION FEEDBACK SUPPORT
TO BOTH OPERATIONAL AND PLANNING PERSONNEL OF
CNATRA AND CNET. THE SMS IS SCHEDULED TO
INCLUDE METHODS AND TECHNIQUES BY WHICH ADAPTIVE
TECHNIQUES MAY BE INCLUDED TO ACHIEVE GREATER
COMPUTER-AIDED STUDENT INDIVIDUALIZATION OF TRAINING.
DURING THE PHASE II EFFORT, PROGRESS WAS MADE
IN THE PREPARATION OF A COMPUTER SOFTWARE SUBSYSTEM
SPECIFICATION OF THE DMS. IMPLEMENTATION, TEST
AND EVALUATION ARE SCHEDULED FOR SUBSEQUENT PHASES.
(MODIFIED AUTHOR ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-777 314 9/2 5/5
AIR FORCE ACADEMY COLO DEPT OF ASTRONAUTICS AND COMPUTER
SCIENCE

THE ON-LINE USER-COMPUTER INTERFACE:
THE EFFECTS OF INTERFACE-FLEXIBILITY
EXPERIENCE, AND TERMINAL-TYPE ON USER-
SATISFACTION AND PERFORMANCE.

(U)

DESCRIPTIVE NOTE: DOCTORAL THESIS,
AUG 73 255P WALTHER, GEORGE H. ;

UNCLASSIFIED REPORT

DESCRIPTORS: *COMPUTERS, *ON LINE SYSTEMS, *MAN
MACHINE SYSTEMS, HUMAN FACTORS ENGINEERING,
PERFORMANCE(HUMAN), PROGRAMMING LANGUAGES,
ATTITUDES(PSYCHOLOGY), INTERFACES
IDENTIFIERS: *DESIGN CRITERIA, TEXT EDITING
SYSTEMS

(U)

(U)

THERE HAS BEEN A RECENT RECOGNITION BY SYSTEMS
DESIGNERS OF THE NECESSITY FOR CONSIDERING THE NEEDS
AND PREFERENCES OF THE USER OF ON-LINE COMPUTERS.
VERY LITTLE EMPIRICAL EVIDENCE EXISTS FOR GUIDING
'USER-ORIENTED' DESIGN EFFORTS. IN THIS STUDY, TWO
LEVELS OF INTERFACE FLEXIBILITY, THE USER'S PRIOR
EXPERIENCE ON-LINE, AND TERMINAL TYPE WERE
INVESTIGATED AS POSSIBLE DETERMINANTS OF USER
SATISFACTION AND PERFORMANCE. THE TASK CONSISTED
OF TEXT CORRECTION WITH AN ON-LINE TEXT EDITOR. A
GENERAL LINEAR MODELS STATISTICAL TECHNIQUE
CONTROLLED FOR THE EFFECTS OF MEASURABLE BUT
UNCONTROLLABLE VARIABLES. INTERFACE FLEXIBILITY,
OPERATIONALIZED AS ALTERNATIVES TO THE USER, IS NOT
UNIFORMLY EFFECTIVE IN PRODUCING OPTIMAL PERFORMANCE
FOR ALL USERS, NOR IN PRODUCING OPTIMAL PERCEPTIONS
OF SATISFACTION. AN ATTEMPT WAS MADE TO SPECIFY THE
KINDS OF USERS FOR WHOM FLEXIBILITY IS 'BEST.'
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-777 725 5/5 5/9
NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER ANNAPOLIS
MD

CNO PILOT PROGRAM FOR REDUCED BRIDGE
MANNING, MANPOWER/EQUIPMENT INTEGRATION, AND
PROCEDURAL DEVELOPMENT, (U)

APR 74 92P EDMONDO, PETER M. ;HALL,
CHARLES C. ;SCHWARTZ, MELVIN A. ;GULLICKSON,
GREG ;
REPT. NO. NSRDC-27-742

UNCLASSIFIED REPORT

DESCRIPTORS: *TIME STUDIES, *MANPOWER, *BRIDGES,
*SHIPBOARD, MODELS, NAVAL PERSONNEL, AUTOMATION,
MAN MACHINE SYSTEMS, HUMAN FACTORS ENGINEERING (U)
IDENTIFIERS: DESIGN (U)

HUMAN ENGINEERING TIME/MOTION STUDIES, USING A
FULL-SCALE BRIDGE MOCK-UP, WERE UNDERTAKEN TO DEVELOP
AND ASSESS ALTERNATIVE MANNING, PROCEDURAL, AND
EQUIPMENT CONFIGURATIONS FOR SHIP BRIDGES. ALSO
THESE STUDIES WERE CONDUCTED TO DETERMINE IF STATIC
MOCK-UP TIME/MOTION STUDIES COULD ASSIST SHIP BRIDGE
DESIGNERS. A FULL-SCALE MOCK-UP OF A DE 1052
BRIDGE WAS EXERCISED TO DEMONSTRATE: AN IMPROVED
CONFIGURATION OF BRIDGE EQUIPMENT, PROCEDURES, AND
MANNING, AND THE FEASIBILITY OF OPERATING A DE 1052
CLASS ESCORT DESTROYER BRIDGE WATCH WITH THREE MEN
(OFFICER OF THE DECK, QUARTERMASTER OF THE WATCH,
AND HELMSMAN), AIDED BY AUGMENTED EQUIPMENT (BELL
LOGGER, AUTOPILOT, AND TAPE RECORDERS) AND MODIFIED
PROCEDURES. RESULTS OF THE TIME/MOTION STUDIES SHOW
THAT, BY ADDING CERTAIN EQUIPMENT AUGMENTATION AND BY
MODIFYING PROCEDURES, THE PERFORMANCE OF A REDUCED
MANNED BRIDGE CAN BE IMPROVED. (AUTHOR) (U)

UNCLASSIFIED

/ZHK13

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-801 362 5/5
ARMY MISSILE COMMAND REDSTONE ARSENAL ALA

METHODS AND WORK MEASUREMENT TECHNIQUES (CHAPTER 6).
SECTION D - SYSTEMS ANALYSIS, (U)

66 85P PROVOST, ROBERT G. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EXTRACT FROM ARMY MISSILE
COMMAND WORK MEASUREMENT HANDBOOK. ALSO INCLUDES
ABSTRACT OF ITS CONTENTS.

DESCRIPTORS: (•HUMAN FACTORS ENGINEERING, MANAGEMENT
PLANNING AND CONTROL), MEASUREMENT, SCHEDULING, FLOW
CHARTING, MANAGEMENT PLANNING AND CONTROL,
PERFORMANCE(HUMAN), DECISION MAKING, INSTRUCTION
MANUALS, DATA STORAGE SYSTEMS, DATA PROCESSING,
INFORMATION RETRIEVAL (U)

CONTENTS: SYSTEMS ANALYSIS; SYSTEMS
ANALYSIS PROCEDURES TRAINING GUIDE; AND TOP
MANAGEMENT CHART (TOMAC) CHARTING
INSTRUCTIONS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-816 523 5/10 17/1
APPLIED PSYCHOLOGICAL SERVICES WAYNE PA SCIENCE
CENTER

VERIFICATION OF A DIGITAL TECHNIQUE FOR SONAR
OPERATION SIMULATION, (U)

MAY 67 25P MACPHERSON, DOUGLAS H. ;
SIEGEL, ARTHUR I. ;
CONTRACT: N00014-66-C-0184

UNCLASSIFIED REPORT

DESCRIPTORS: (*SONAR PERSONNEL, *MOTOR REACTIONS), (*MAN
MACHINE SYSTEMS, SIMULATION), (*SONAR EQUIPMENT,
SIMULATION), DIGITAL SYSTEMS, PERFORMANCE(HUMAN),
STRESS(PHYSIOLOGY), COMPUTERS, HUMAN FACTORS
ENGINEERING, ACOUSTIC DETECTORS, TARGET RECOGNITION (U)
IDENTIFIERS: AN/SQS-4 (U)

A PREVIOUSLY DEVELOPED COMPUTER BASED, DIGITAL
SIMULATION TECHNIQUE WAS APPLIED TO A SONAR SITUATION
IN ORDER TO VERIFY THE APPLICABILITY OF THE TECHNIQUE
FOR SIMULATING SONAR DETECTION AND TRACK TASKS. NO
STATISTICALLY SIGNIFICANT DIFFERENCES WERE NOTED
BETWEEN TASK SUCCESS PREDICTIONS OF THE MODEL AND
CRITERION DATA BASED ON THE PERFORMANCE OF SONAR
TECHNICIANS. IN A SECOND STUDY ASPECT, THE TIME
FOR SONAR TECHNICIANS, AT TWO SKILL LEVELS, TO
PERFORM THE MOTOR ACTS INVOLVED IN SONAR APPARATUS
OPERATION AND THEIR TIME TO DETECT A TARGET WAS
INVESTIGATED. THE MOTOR PERFORMANCE OF LESS
SKILLED (JOURNEYMAN) OPERATORS WAS ABOUT 20%
SLOWER AND 20% MORE VARIABLE THAN THAT OF THE MORE
SKILLED TECHNICIANS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO: /ZHK13

AD-823 798 17/1 9/2 5/9
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

ANALYTICAL INVESTIGATIONS OF DIGITAL INFORMATION
PROCESSING SYSTEMS. VOLUME II. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 2, APR 66-JUL 67,
JUL 67 136P GLORIOSO, ROBERT M. ;
REPT. NO. U417-67-030
CONTRACT: NONR-2512(00)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
CONNECTICUT UNIV., STORRS. SEE ALSO VOLUME I
DATED AUG 66, AD-803 277.

DESCRIPTORS: (*DATA PROCESSING, *SONAR RECEIVERS),
(*DIGITAL COMPUTERS, *SONAR PERSONNEL),
OPERATORS(PERSONNEL), SIGNAL-TO-NOISE RATIO, STOCHASTIC
PROCESSES, FEEDBACK, PERFORMANCE(HUMAN), UNDERWATER
OBJECT LOCATORS, SONAR SIGNALS, DISCRIMINATORS,
MEMORY(PSYCHOLOGY), RETENTION(PSYCHOLOGY), VISION,
THRESHOLDS(PHYSIOLOGY), ADAPTATION(PHYSIOLOGY),
LEARNING, ARTIFICIAL INTELLIGENCE, PATTERN RECOGNITION,
MAN MACHINE SYSTEMS, BIBLIOGRAPHIES, HUMAN FACTORS
ENGINEERING (U)
IDENTIFIERS: *SUBIC (U)

THE AIM OF THIS PROJECT IS TO PROVIDE BASIC
KNOWLEDGE CONCERNING THE METHODS WHICH MAY BE USED BY
A MAN-COMPUTER SYSTEM TO DETECT THE PRESENCE OF A
TARGET, USING DATA FROM A PASSIVE SONAR RECEIVER.
THIS RESEARCH CONSISTS OF ANALYTICAL STUDIES TO
EVALUATE IMPORTANT SYSTEM PARAMETERS AND EXPERIMENTAL
INVESTIGATIONS MEASURING OPERATOR PERFORMANCE UNDER
VARIOUS OPERATING CONDITIONS. THE TWO REPORTS IN
THIS VOLUME ARE CONCERNED WITH THE BEHAVIOR OF
SYSTEMS UNDER CHANGING OR DYNAMIC CONDITIONS. THE
FIRST REPORT IS AN INTRODUCTION AND BIBLIOGRAPHY
(THROUGH SPRING 1967) COVERING THE AREAS OF
ARTIFICIAL INTELLIGENCE, ADAPTATION, LEARNING, AND
PATTERN RECOGNITION. IN ADDITION, THE DEFINITIONS
OF 'ADAPTATION' AND 'LEARNING' ARE DISCUSSED. THE
SECOND REPORT IS AN EXTENSIVE ANALYTICAL AND
EXPERIMENTAL STUDY OF THE OPERATOR'S BEHAVIOR IN A
DYNAMIC DETECTION TASK. THE EFFECTS OF CHANGES IN
SIGNAL TO NOISE AND FEEDBACK STATE WERE INVESTIGATED.
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-823 846 17/1 9/2 5/9
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV

EXPERIMENTAL INVESTIGATIONS OF MAN-MACHINE PROCESSING
OF INFORMATION. VOLUME II. (U)

DESCRIPTIVE NOTE: PROGRESS REPT. JUL 66-JUL 67,
JUL 67 252P BOOTH, TAYLOR L. ; GLORIOSO,
ROBERT M. ; KAUFMAN, HERBERT M. ; LAMB, JERRY
C. ; LEVY, ROBERT M. ;
REPT. NO. U417-67-031
CONTRACT: NONR-2512(00)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH
CONNECTICUT UNIV. STORRS. SEE ALSO VOLUME I,
AD-653 278.

DESCRIPTORS: (*DATA PROCESSING, *MAN MACHINE SYSTEMS),
(*SONAR PERSONNEL, *SONAR RECEIVERS), REPORTS, SONAR
TARGETS, IDENTIFICATION SYSTEMS, SONAR EQUIPMENT, SONAR
SIGNALS, OPERATORS(PERSONNEL), PASSIVE SYSTEMS,
DETECTION, DISPLAY SYSTEMS, PATTERN RECOGNITION, VISUAL
ACUITY, DECISION MAKING, CODING, PERFORMANCE(HUMAN),
HUMAN FACTORS ENGINEERING, SIGNAL-TO-NOISE RATIO,
BACKGROUND, NOISE, FLOW CHARTING, SUBROUTINES (U)
IDENTIFIERS: LIGHT PENS, ON-LINE SYSTEMS, *SUBIC (U)

THE AIM OF THIS PROJECT IS TO PROVIDE BASIC
KNOWLEDGE OF THE METHODS WHICH MAY BE USED BY A MAN-
COMPUTER SYSTEM TO DETECT THE PRESENCE OF A TARGET,
USING DATA FROM A PASSIVE SONAR RECEIVER. THIS
RESEARCH CONSISTS OF ANALYTICAL STUDIES TO EVALUATE
IMPORTANT SYSTEM PARAMETERS AND EXPERIMENTAL
INVESTIGATIONS MEASURING OPERATOR PERFORMANCE UNDER
VARIOUS OPERATING CONDITIONS. THE FIRST REPORT IS
A DESCRIPTION OF THE OVERALL RESEARCH CAPABILITY OF
THE DISPLAY FACILITY AT THE UNIVERSITY OF
CONNECTICUT FACILITY. THE NEXT TWO REPORTS
DESCRIBE EXPERIMENTAL INVESTIGATIONS USING A
SIMULATED SONAR SEARCH TASK. THE RESULTS OF THE
OPERATOR'S ABILITY TO DETECT CURVED TARGETS AND TO
USE COMPUTER AIDS UNDER LIGHT-PEN CONTROL ARE
DESCRIBED IN ONE WHILE THE EFFECTS OF TRANSFORMING
THE DOTS TO VERTICAL LINE SEGMENTS ARE DISCUSSED IN
THE OTHER. THE NEXT THREE REPORTS DESCRIBE A
SERIES OF EXPERIMENTS ON BASIC HUMAN INFORMATION
PROCESSING CHARACTERISTICS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-831 288 5/5 5/10
ARMY BEHAVIORAL SCIENCE RESEARCH LAB WASHINGTON D C

RELATION OF CERTITUDE JUDGEMENTS TO CHARACTERISTICS
OF UPDATED SYMBOLIC INFORMATION. (U)

DESCRIPTIVE NOTE: TECHNICAL RESEARCH NOTE,
APR 68 28P ANDREWS, ROBERT S. ; VICINO,
FRANK L. ; RINGEL, SEYMOUR ;
REPT. NO. BESRL-TRN-194
PROJ: DA-2J024701A723

UNCLASSIFIED REPORT

DESCRIPTORS: (*COMMAND AND CONTROL SYSTEMS, DISPLAY
SYSTEMS), (*DECISION MAKING, PERFORMANCE(HUMAN)),
SYMBOLS, UNCERTAINTY, ACCURACY, AUTOMATION,
PERCEPTION(PSYCHOLOGY), DATA PROCESSING, DATA STORAGE
SYSTEMS, REASONING, INFORMATION RETRIEVAL, CODING,
ANALYSIS OF VARIANCE, HUMAN FACTORS ENGINEERING (U)

A SERIES OF STUDIES WAS CONDUCTED BY THE COMMAND
SYSTEMS TASK IN WHICH A VARIETY OF DISPLAY
VARIABLES ARE SYSTEMATICALLY INVESTIGATED IN TERMS OF
THEIR EFFECTS ON INFORMATION ASSIMILATION AND
DECISION MAKING IN A COMMAND AND CONTROL SETTING.
THE PRESENT STUDY EXPLORES THE EFFECTS OF TYPE AND
NUMBER OF UPDATING CHANGE, AMOUNT OF INFORMATION
PRESENTED, AND SELECTED ENHANCEMENT TECHNIQUES ON
CONFIDENCE AND ON THE RELATIONSHIP OF CONFIDENCE TO
ACCURACY OF INFORMATION ASSIMILATION. FINDINGS
INDICATE: (1) THE MORE EFFECTIVE THE ENHANCEMENT
TECHNIQUE, THE HIGHER THE CERTITUDE-ACCURACY
RELATIONSHIP. WITH THE BEST ENHANCEMENT TECHNIQUE
(DOUBLE-CUE CODING), 64 PERCENT OF THE CERTITUDE
VARIANCE COULD BE ACCOUNTED FOR BY ACCURACY VARIANCE;
WITH THE POOREST (HARD COPY), ONLY 20 PERCENT.
(2) BOTH OVER-CERTITUDE AND UNDER-CERTITUDE WAS
EVIDENCED, WITH OVER-CERTITUDE TENDING TO INCREASE
WITH THE LESS EFFECTIVE ENHANCEMENT TECHNIQUES.
(3) INCREASE IN EITHER AMOUNT OF INFORMATION
PRESENTED OR AMOUNT OF UPDATING RESULTED IN DECLINE
IN BOTH MEAN ACCURACY AND MEAN CERTITUDE, THE RATE
VARYING WIDELY OVER THE DIFFERENT ENHANCEMENT
TECHNIQUES AND OVER TYPES OF UPDATE. (4)
ALTHOUGH EFFECTS OF THE MAIN VARIABLES ON ACCURACY
AND CERTITUDE WERE HIGHLY SIMILAR, THE CORRESPONDENCE
DID NOT HOLD FOR INDIVIDUAL PERFORMANCE SCORES.
FINDINGS SUGGEST NEED TO IMPROVE AGREEMENT BETWEEN
A MAN'S PERFORMANCE IN INFORMATION ASSIMILATION AND
HIS JUDGMENT OF THAT PERFORMANCE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-835 025 5/5 5/3
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

HUMAN FACTORS RESEARCH IN THE BRITISH IRON AND STEEL
RESEARCH ASSOCIATION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
JUN 68 9P SINAIKO, H. WALLACE ;
REPT. NO. ONRL-38-68

UNCLASSIFIED REPORT

DESCRIPTORS: (*HUMAN FACTORS ENGINEERING, GREAT
BRITAIN), (*IRON INDUSTRY, SCIENTIFIC RESEARCH), VISUAL
INSPECTION, DESIGN, STEEL INDUSTRY, PROTECTIVE CLOTHING,
CONTROL, MANAGEMENT ENGINEERING, DECISION MAKING,
MONITORS, COMPUTERS, INTERACTIONS, MAN MACHINE SYSTEMS,
EFFECTIVENESS (U)

THE REPORT SUMMARIZES ANALYTIC, EXPERIMENTAL, AND
CONSULTING WORK OF THE HUMAN FACTORS GROUP AT THE
BRITISH IRON AND STEEL RESEARCH
ASSOCIATION. EXAMPLES OF RECENTLY COMPLETED
STUDIES, AS WELL AS CURRENT WORK, IN PROBLEMS OF
VISUAL INSPECTION, CONTROL ROOM DESIGN FOR CONTINUOUS
PROCESS MONITORING FUNCTIONS, AND THE MEASUREMENT OF
MENTAL EFFORT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-836 650 17/7 17/9 1/2 15/7
BELL AEROSYSTEMS CO BUFFALO N Y

TACTICAL INSTRUMENT LANDING (TACLAND) SYSTEM
STUDY.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL 67-29 FEB 68,
APR 68 445P SULLIVAN, NEIL ; TAYLOR, JAMES

K. ;

REPT. NO. BA-6145-950001

CONTRACT: F33615-67-C-1908

PROJ: AF-682C

MONITOR: AFFDL TR-68-22

UNCLASSIFIED REPORT

DESCRIPTORS: (•AIRCRAFT LANDINGS, •INSTRUMENT FLIGHT),
(•AIR TRAFFIC CONTROL SYSTEMS, STATE-OF-THE-ART
REVIEWS), RADIO NAVIGATION, AIRMOBILE OPERATIONS,
TACTICAL AIR SUPPORT, CLOSE SUPPORT, ALL WEATHER
AVIATION, CARGO, CARGO PARACHUTES, LOGISTICS, LANDING
AIDS, GLIDE PATH SYSTEMS, GROUND-CONTROLLED APPROACH
RADAR, BEACONS, RELIABILITY, HUMAN FACTORS ENGINEERING,
MAINTAINABILITY, TAKEOFF, ANTENNAS, DATA PROCESSING,
PLANNING (U)

IDENTIFIERS: EXTRACTION PARACHUTES, •TACLAND (TACTICAL
INSTRUMENT LANDING), •TACTICAL INSTRUMENT
LANDINGS (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-842 708 5/5 5/2 5/10
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

THE FIELD UNIT AS AN INTERFACE BETWEEN
PSYCHOLOGICAL RESEARCH AND HUMAN FACTORS
APPLICATIONS.

(U)

OCT 68 20P ZEIDNER, JOSEPH ; BAKER, JAMES
D. ;
REPT. NO. ONRL-75-68

UNCLASSIFIED REPORT

DESCRIPTORS: (•INFORMATION RETRIEVAL, HUMAN FACTORS
ENGINEERING), (•NAVAL INTELLIGENCE, COMMAND AND CONTROL
SYSTEMS), DATA PROCESSING, DECISION MAKING,
PSYCHOLOGICAL TESTS, OPERATIONS RESEARCH, BEHAVIOR,
INTERFACES

(U)

THIS REPORT REVIEWS THE HUMAN FACTORS RESEARCH
BEING CONDUCTED TO SUPPORT, ON THE SPOT, A FIELD
DEVELOPMENT OF A COMMAND INFORMATION PROCESSING
SYSTEM. STUDIES DESCRIBED ARE THE AREA OF
DECISION-MAKING, THE USE OF CERTITUDE JUDGMENT,
DISPLAYS, AND USER-ORIENTED INFORMATION REQUIREMENTS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-844 910 13/8
BENDIX CORP SOUTHFIELD MICH BENDIX RESEARCH LABS

PERFORMANCE MEASUREMENT TECHNIQUES FOR
ADAPTIVE PROCESS CONTROL.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 SEP 66-30 APR 68,
SEP 68 182P VALEK, ROBERT J. ; RUSSO,

FRANK A. ;
REPT. NO. BRL-4468
CONTRACT: AF 33(615)-2634
PROJ: AF-8-323
MONITOR: AFML TR-68-265

UNCLASSIFIED REPORT

DESCRIPTORS: (*PRODUCTION CONTROL, *ADAPTIVE CONTROL
SYSTEMS), LATHES, ELECTRON BEAM WELDING, GRINDING,
PATTERN RECOGNITION, DIGITAL COMPUTERS, DATA PROCESSING,
LOGIC CIRCUITS, TRAINING, COSTS, MANUFACTURING, HUMAN
FACTORS ENGINEERING, AUTOMATION (U)

IN ADAPTIVE PROCESS CONTROL SYSTEMS, AN ESSENTIAL
REQUIREMENT IS THE AVAILABILITY OF ON-LINE FEEDBACK
DATA INDICATIVE OF THE ACTUAL PROCESS PERFORMANCE.
THE MEASUREMENT OF SUCH DATA OFTEN POSES DIFFICULT
DESIGN PROBLEMS BECAUSE AVAILABLE SENSORS ARE CAPABLE
OF MEASURING ONLY CERTAIN PROCESS VARIABLES WHICH ARE
RELATED TO TRUE PERFORMANCE BY COMPLEX FUNCTIONS.
DETERMINATION OF THESE FUNCTIONS REQUIRES EXTENSIVE
COLLECTION AND ANALYSIS OF EXPERIMENTAL DATA FOR ALL
TYPES OF PROCESS CONDITIONS. THIS REPORT DESCRIBES
A PROJECT CONDUCTED TO SYSTEMATIZE AND SIMPLIFY THE
PERFORMANCE AND MEASUREMENT PROBLEM. THE APPROACH
TO THIS OBJECTIVE WAS BASED ON THE USE OF A DIGITAL
COMPUTER TO IMPLEMENT A TRAINABLE PATTERN RECOGNITION
DATA PROCESSING TECHNIQUE. THE APPROACH WAS
DEMONSTRATED BY DESIGNING AND FABRICATING A PROTOTYPE
PERFORMANCE MEASUREMENT SYSTEM AND BY EVALUATING THE
SYSTEM OPERATING IN CONJUNCTION WITH THREE DIVERSE
MANUFACTURING PROCESSES: A TURNING PROCESS
(LATHE), AN ELECTRON-BEAM WELDING PROCESS, AND A
GRINDING PROCESS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-856 929 5/9 5/5 14/5
NAVAL TRAINING DEVICE CENTER ORLANDO FLA

VISUAL SIMULATION AND IMAGE
INTERPRETATION.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,
APR 69 93P BLISS, WILLIAM D. ;
REPT. NO. NAVTRADEVCECEN-IH-153
PROJ: NAVTRADEVCECEN-7885-21

UNCLASSIFIED REPORT

DESCRIPTORS: (*TARGET RECOGNITION, DISPLAY SYSTEMS),
(DISPLAY SYSTEMS, TRAINING DEVICES), (*SURFACE TARGETS,
TARGET ACQUISITION), VISUAL PERCEPTION, PHOTOGRAPHIC
IMAGES, CLOSED CIRCUIT TELEVISION, MOTION PICTURES,
TRAINING FILMS, TERRAIN, MODELS(SIMULATIONS),
ILLUMINATION, COMPUTERS, COLORS, BIBLIOGRAPHIES,
REVIEWS, AERIAL RECONNAISSANCE, PERFORMANCE(HUMAN),
RESOLUTION, PHOTOINTERPRETATION, IMAGES (U)
IDENTIFIERS: HUMAN FACTORS ENGINEERING, PHOTOMOSAICS, (U)
SIMULATION, VISION

THIS REPORT SUMMARIZES THE AVAILABLE DATA ON
PARAMETERS AFFECTING TARGET RECOGNITION IN DYNAMIC
IMAGE FORMING SYSTEMS. THE VARIOUS ALTERNATIVE
WAYS IN WHICH VISUAL SYSTEMS CAN BE SIMULATED AND THE
RELATIVE MERITS OF EACH APPROACH ARE DISCUSSED.
SEVENTY-ONE RESEARCH REPORTS WHICH PURPORT TO
RELATE TO THE EFFECT UPON OPERATOR PERFORMANCE OF
VARIATIONS IN THE PARAMETERS OF IMAGE FORMING SYSTEMS
ARE ANALYZED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-859 300 5/10 5/9 5/2
AIR FORCE HUMAN RESOURCES LAB WRIGHT-PATTERSON AFB
OHIO

REVIEW AND ANALYSIS OF PERSONNEL SUBSYSTEM
TEST AND EVALUATION LITERATURE.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT. OCT 66-AUG 67,
JAN 69 390P ASKREN, WILLIAM B. ; NEWTON,
RICHARD R. ;
PROJ: AF-1710
TASK: 71006
MONITOR: AFHRL TR-68-7

UNCLASSIFIED REPORT

DESCRIPTORS: (*PERFORMANCE(HUMAN), *MILITARY
REQUIREMENTS), (*TEST CONSTRUCTION(PSYCHOLOGY),
*REVIEWS), PERFORMANCE(HUMAN), MAN MACHINE SYSTEMS,
SAFETY, MAINTENANCE, DATA PROCESSING, PROBLEM SOLVING,
HUMAN FACTORS ENGINEERING, JOB ANALYSIS, TRAINING,
PERSONNEL MANAGEMENT, SYSTEMS ENGINEERING, ABSTRACTS (U)

THE REPORT REVIEWS AND ANALYZES 95 DOCUMENTS
RELATED TO PERSONNEL SUBSYSTEM TEST AND EVALUATION.
THE REPORTS ARE DIVIDED INTO TWO GROUPS: (1)
SYSTEM TESTS AND (2) RELATED RESEARCH MATERIAL.
EACH REPORT IS ABSTRACTED AND THEN ANALYZED FURTHER
IN TERMS OF 11 CATEGORIES: SCOPE AND RELATION TO
PERSONNEL SUBSYSTEM ELEMENTS; TEST OBJECTIVES;
DATA REQUIREMENTS AND TEST CRITERIA; DATA
COLLECTION METHODOLOGY; SUPPORT REQUIREMENTS;
REDUCING AND ANALYZING DATA; SIGNIFICANT TEST
RESULTS; COMMUNICATING AND USING TEST RESULTS;
FACTORS IN PLANNING A TEST PROGRAM; FACTORS IN
CONDUCTING A TEST PROGRAM; AND OTHER PROBLEMS.
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-865 233 15/5 1/3
BOEING CO SEATTLE WASH

GENERAL OPERATIONAL AIRCRAFT LOGISTICS
SIMULATION (GOALS). VOLUME I, DESCRIPTION
AND RESULTS,

(U)

DEC 69 113P KEENEY, J. H. ;
REPT. NO. D162-10155-1

UNCLASSIFIED REPORT

DESCRIPTORS: (AIR FORCE LOGISTICS COMMAND, INTEGRATED
SYSTEMS), MISSION PROFILES, MODELS(SIMULATIONS), HUMAN
FACTORS ENGINEERING, CLOSE SUPPORT, MAINTENANCE,
STRATEGIC AIR COMMAND, COMPUTER PROGRAMS, DATA
PROCESSING, DATA STORAGE SYSTEMS, JET BOMBERS,
SCHEDULING, AIR FORCE EQUIPMENT, STRATEGIC MATERIALS,
SUPPLY DEPOTS, MANPOWER, MANAGEMENT ENGINEERING, AIR
FORCE OPERATIONS, MODELS(SIMULATIONS), OPERATIONAL
READINESS, COST EFFECTIVENESS, LIFE EXPECTANCY, SPARE
PARTS

(U)

IDENTIFIERS: B-52 AIRCRAFT, B-52G AIRCRAFT, GENERAL
OPERATIONAL AIRCRAFT LOGISTICS SIMULATION,
GOALS(GENERAL OPERATIONAL AIRCRAFT LOGISTICS SIMULAT,
ILS(INTEGRATED LOGISTIC SUPPORT), LOGISTICS
SUPPORT

(U)

THIS DOCUMENT DESCRIBES THE GENERAL OPERATIONAL
AIRCRAFT LOGISTICS SIMULATION (GOALS) MODEL
AND RESULTS ACHIEVED TO DATE. THE MODEL WAS
DEVELOPED TO SIMULATE A PEACETIME MILITARY AIRCRAFT
OPERATION, INCLUDING LOGISTICS ELEMENTS. THE MODEL
IS CAPABLE OF RECEIVING DETAILED LOGISTICS DATA
(SPARES, EQUIPMENT, FACILITIES, PERSONNEL,
MAINTENANCE TASKS, MAINTENANCE TIMES, RELIABILITY
FACTORS, AND MAINTAINABILITY CRITERIA) AND UTILIZES
THESE FACTORS AS REQUIRED TO SUPPORT A SPECIFIED
OPERATIONAL NEED. OPERATIONAL VARIATIONS CAN BE
APPLIED TO DETERMINE IMPACT ON LOGISTICS AND SUPPORT
COSTS. CONVERSELY, LOGISTICS AVAILABILITY CAN BE
ADJUSTED TO MEASURE THE INFLUENCE ON OPERATIONS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZHK13

AD-900 567 5/8 5/9 17/2 17/4
AUTONETICS ANAHEIM CALIF

EFFECTS OF SIGNAL DENSITY, UPDATE RATE, AND
COLOR CODING UPON HUMAN INFORMATION
PROCESSING, (U)

OCT 71 12P WYMAN, M. J. ; GREENING, C.
P. ; STURM, R. D. ;
REPT. NO. X71-632/401
MONITOR: G:DEP 347.00.00.00.C1.50

UNCLASSIFIED REPORT

DESCRIPTORS: (*DISPLAY SYSTEMS, MAN MACHINE SYSTEMS),
DATA TRANSMISSION SYSTEMS, VISUAL SIGNALS, REAL TIME,
PERFORMANCE(HUMAN), MONITORS, DECISION MAKING, COLOR
VISION, RESPONSE(BIOLOGY), SCREENS(DISPLAYS), COMMAND
AND CONTROL SYSTEMS, MULTIPLE OPERATION, ERRORS,
DETECTION, REACTION(PSYCHOLOGY), REFLEXES, COLORS,
CODING, OPERATORS(PERSONNEL), EXPERIMENTAL DESIGN, DATA
PROCESSING, THREAT EVALUATION, PROBABILITY, SIMULATION,
ELECTRONIC COUNTERMEASURES, COMPUTER PROGRAMMING,
STATISTICAL ANALYSIS (U)
IDENTIFIERS: COLOR CODING, DESIGN CRITERIA, SCENARIOS,
SIGNAL DENSITY (U)

A RESEARCH PROGRAM WAS UNDERTAKEN TO DETERMINE
OPERATOR INFORMATION PROCESSING CAPABILITIES FOR THE
TYPE OF DISPLAY WHICH IS TYPICAL OF COMPUTER-
CONTROLLED SYSTEMS. THESE DISPLAYS REQUIRE REAL-
TIME SURVEILLANCE BY THE OPERATOR SO THAT, IF
NECESSARY, HE MAY OVERRIDE THE COMPUTER AT ANY POINT
IN TIME. THIS PROCESS HAS BEEN REFERRED TO AS
ACTIVE MONITORING. THE HUMAN MONITOR MUST MAINTAIN
AWARENESS OF THE DISPLAYED EVENTS AND COMPUTER
ACTIONS, IN ORDER TO INTERACT WITH THE COMPUTER IN A
REAL-TIME FASHION. ONE EXAMPLE OF THIS TYPE OF
SYSTEM WOULD BE AN AIRBORNE COMPUTER-CONTROLLED
ELECTRONIC COUNTERMEASURES DISPLAY. A PART-TASK
SIMULATOR FOR THIS TYPE OF DISPLAY SYSTEM WAS
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